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The "Journal's" Syllabus of the National Electrical Safety Code

THE trial year of the National Electrical Safety Code is approaching an end. Through the efforts of the United States Bureau of Standards, the national associations of affected interests and the technical press, it has been brought forcefully to the attention of all who need to be familiar with it in principle and in detail. It is automatically taking its place alongside the National Electrical Code, the guide in electrical construction with respect to fire risk. Familiar as it now is in general, however, the code is not as well known in detail as it might be, and as it needs to be if the best results are to be secured with its aid. In the electric railway field executives as well as engineers ought to have a comprehensive grasp of its provisions because they will be blamed if safety conditions on their properties are not what they should be. Realizing the difficulty necessarily experienced by busy officials in finding the time to study this code as they would like, the editors of the ELECTRIC RAILWAY JOURNAL cast about for some plan by which it could be grasped as a whole in a minimum of time. The outcome was an arrangement with Dr. E. B. Rosa and W. J. Canada, of the Bureau of Standards, to produce a digest or syllabus of the code for the specific needs of electric railway men. This work has just been completed and it will appear in this paper in two installments, the first being in the present issue. Dr. Rosa and Mr. Canada, who together largely fathered the code, have boiled it down to such compass that the whole syllabus can be read slowly in an hour, leaving the reader with a clear perspective view of the plan and scope of the work. It must not be expected that this outline will displace the code itself, which is already condensed as much as possible. Its function is merely to serve as a guide to the full text, for which purpose it is admirably fitted.

Regulating Current in Incandescent Headlight Circuits

PURE metals possess the inherent property of increasing in resistance with temperature. For apparatus requiring constant resistance this property is undesirable, and alloys having resistance practically independent of temperature are used in such cases. There are some cases, however, in which this property furnishes a protection against fluctuations in voltage as, for example, in the tungsten incandescent lamp. Here the current fluctuates much less than the voltage, and there is a tendency in the direction of self-regulation. The same principle applies in a more marked degree in the "ballast" used with the Nernst incandescent lamp, which contains a kaolin filament quite sensitive to variation in current. A very fine iron wire, inclosed in a vacuum tube and connected in series with the filament, varies its resistance so much with change in current as to serve as an almost perfect compensation for a tendency of the current to fluctuate with changes in voltage. At temperatures from zero up to say 150 deg. C., many pure metals increase in resistance at the rate of about 40 per cent per 100 deg. or 100 per cent per 250 deg. In tungsten the rate is slightly higher. At very high temperatures the variation is less definite, but the principle applies. The value of "resistance temperature coefficient" given is, however, a convenient one to remember and serves at least for qualitative reasoning. For some time past the fact that tungsten has a "positive" temperature coefficient has been utilized in regulating the current in incandescent headlights, the car lamps being utilized as resistors for the purpose. In an article published elsewhere in this issue the author gives the results of tests made to determine the effects of variation in voltage in such an arrangement. The data which he presents in graphical and tabular forms will be valuable for reference.

What Is the Disease "Streetcaritis"?

THE *Searchlight*, a monthly published at Grayslake, Ill., defines this word as the tendency of a large portion of the public to criticise the electric railway service which they patronize. Most of these critics are not perfect in the performance of their own duties or in their daily life, but this makes no difference. If they see or if they think they see any flaw in the quality of the electric railway transportation which they expected, they complain to each other and to the management. In fact, an improvement is quite as likely to draw their condemnation as a defect if it is of sufficient prominence to attract their attention. According to the paper quoted, this disease of the public "is as universal as street cars, as perennial as the burdock, as contagious as the itch and as virulent as smallpox." But the paper adds: "There is no more need for it than there is for any of these other things, and the same intelligence which will prevent them will prevent this." "The trouble is," it goes on to say, "that people want low fares, high wages, useful if profitless service, and the inalienable right to cuss the management. In the public mind these things constitute progressive and advanced public utility regulation. They do not. It is these things which retard the advancement and development of the service." The remedy it

suggests is a better understanding of the utility by its patrons, and this can be secured only through publicity. This is undoubtedly true, and more companies are realizing this fact than ever before. The campaign for higher fares has been an education to the railways as well as to the public, although we believe that there would have been a marked movement in the direction of greater frankness and more publicity, even if the higher fare emergency had not arisen. Many companies have joined the movement. It is a part of the spirit of the times.

Keep Up Good Service Even if Fares Are Too Low

As time goes on it becomes clearer and clearer that it is a false policy to cut down on up-keep of the electric railway plant when income falls off. The reason is simple and lies in the psychology of the public. A man realizes only that which actually touches him. And actual realization is a result not of logic but of feeling. Let us consider a typical case. Suppose that, owing to increased costs of material, the company is pinched. The nickel no longer produces sufficient revenue to pay all the bills, so the company begins to tell its troubles to the public.

As a matter of fact, the public doesn't care a rap about the company's troubles. It has heard the calamity cry too often. The words "bankruptcy" and "receivership" frighten only the general manager and the stockholders. But let an individual member of the public once realize that this situation is going to touch him and mean that because of insufficient revenue the service on the street where he lives may be cut next week from cars every three minutes to cars every six minutes and he is interested at once—even if to keep up the good service will necessitate an increased fare.

One thing is certain—the American wants good service. He's your friend if you give it to him. He's your critic if you do not. Once let him actually experience long waits for cars or rough rides over bad roadbed in dirty cars that are half heated and poorly lighted, and he will hold you responsible and find fault regardless of the fare or of your financial condition. The public as a public simply won't believe the service cannot be better. No matter what the fare, you cannot win friends by cutting down on service.

If in time of stress the companies keep up the service the interest of the public will be aroused on its side when this service is threatened.

Increasing costs leave the company three courses to pursue:

The first is to go on as companies generally have done, neglecting depreciation in the hope of better days to come. This has led to severe condemnation by both courts and public service commissions, and has also led to losses by investors. Bitter experience has taught railway men the short-sightedness of this course. They are no longer willing to be Micawbers, waiting for something to turn up.

The second, now that the law enjoins proper attention to depreciation, is frankly to lay the whole case before the public, asking for increased income equivalent to the increased cost of service, meantime keeping service up to standard. This is the policy of wisdom which more and more companies are following. The public through its official bodies must decide whether the service is to be kept up or allowed to degenerate. The typical American decision will be to pay the cost and have the service.

The third course is to skimp and pare at every point, resulting in service unsatisfactory to either company or public. This is the alternative which the companies in New York and other states which have applied for higher fares are now seeking to avoid.

But let the companies bear this firmly in mind. It is their duty—and no one else can do it—to convince both commission and public that the fair decision is the choice between more income or bad service. They should keep the service up while the matter is under investigation, acting on the theory that both commission and public really prefer the square deal and the wisest solution, regardless of demagogic clamor or ill-founded criticism. This policy should be persisted in unless, as is by no means to be expected, the commission recognizes no responsibility whatever to investors who have furnished the capital to set the railway system going. In that case, it is a choice between bad service, no service or bankruptcy.

The Public Should Deal with Innovations on Their Merits

In matters relating to utility service the public is likely to regard any innovation with suspicion, either because of natural conservatism or because of fear that the change is suggested purely in the interests of the public utility. Time was, during the infancy of the electric railway industry, when people looked forward to the travel of heavy, noisy cars on tracks laid in the city streets as an abomination. Now it is generally conceded that the transportation facilities of a community are closely allied with its development, and the electric street railway has come to be regarded as a vital factor in business and social life. However, proposals to change rates of fare, to use one-man cars, etc., are too frequently met by the charge that such operating changes are not specified in the company's franchise, the terms of which at one time had been fully accepted by the company, without any consideration of the desirability or justice of the change in the light of present conditions or the results in service to the public.

Opposition to the skip stop is another good example of this common inertia of public opinion. Fast and accommodation service on steam roads is admittedly most efficient for long-distance transportation, just as express and local trains are used in rapid-transit operation for handling large crowds quickly. Either of these systems necessarily works inconvenience to certain patrons no less than the skip stop imposes upon those who live nearest the omitted corners. Not unlike many other improvements in electric railway facilities in-

tended to give more, better and safer service and not generally comprehended by the average person, the skip stop as a form of express service has come to do its part. It can only be of the greatest good to the largest number. Those who oppose such changes on the ground that precedence or statutes alone prohibit them, or from distrust in the motives of their promoters, are deliberately blocking the progress of their community and are ignoring its vital needs.

Reversing the Present System of Rate Regulation

IS THE present system of rate regulation satisfactory? If not, how should it be changed? It is difficult to imagine questions more vital than these to the electric railway industry, but they are not ones which all operators have answered openly and fully. Too many are prone to grumble at the existing system without really using their gray matter to work out a plan for its improvement. It is much more easy to criticise than to construct. For these reasons we have read with great interest the speech made last week by President M. C. Brush before the Massachusetts Legislative Investigating Commission. Mr. Brush tears down the existing regulatory system, but he also builds it up, and to the latter process the industry should give serious thought.

A perusal of Mr. Brush's speech, abstracted in last week's and this week's issues, will show how he has got down to fundamentals in rate-making. To his mind the present system is defective because it places an unfair and unwise burden upon the utility. As a rule, a company desiring to increase its fare must file an application which must receive commission approval, or a revised tariff which may be suspended pending such approval. In either case the company must justify the increase before it can secure relief. This in reality means that in order for the company to be successful it must first become actually unsuccessful. Is this overdrawn? By no means, as we can testify. A company recently asked for additional revenue, on the plea of dire necessity. It produced figures showing the beginning of a serious decline in net earning power. "Ah," said the commission's experts, "but this may be only temporary." So now the case is held up until the company can accumulate figures indisputably showing its dangerous condition. In other words, when a group of business men in all seriousness announce that their company is on the road to bankruptcy, their judgment counts for nothing and they cannot secure relief until they are actually insolvent.

This is not the fault of the commissioners, but of the law. But why should it be?—says Mr. Brush. If a man tells the doctor he is going to die, the doctor does not calmly wait until the embalmer is called in. So Mr. Brush thinks that the existing system should be changed. He suggests giving the directors of an electric railway the power to establish an increase in fare to go into effect in thirty days. The new fares will continue thereafter for not less than one year if the commission does not after due investigation change the fare upon the ground of excessiveness or of managerial defects, or if the commission disapproves and the court upon appeal overrules it on questions of judgment. Further interesting details—such as those in regard to a provision for depreciation, the restriction of the return to 6 per cent or that higher rate necessary to invite additional capital, and the use of the surplus above the fair return under commission approval—we will not discuss. We are here concerned simply with the reversal in rate regulation procedure embodied in Mr. Brush's major recommendation.

For that is exactly what his plan means. Now the burden is on the utility of proving the absolute need of a higher fare, no weight being given to the judgment of its officials. Under Mr. Brush's system, the burden would be on the complainant, the public, of proving that the company had taken relief in excess of its needs. And in the meantime the company would have the benefit of the doubt, the public being duly protected against the payment of excess dividends. But one may ask how the public could demonstrate by any legal standards and legal evidence that the new fares were excessive, without a fairly long trial, any more easily than a company now can prove that it needs more revenue before its coffers go bare. Very likely it could not, but even then Mr. Brush's plan is the better.

The reason may be summed up in these words—electric railway credit. As Mr. Brush says, the entire basis of the proper relationship between a public utility and the community served is credit. Commissions thus far have minimized this point, probably unintentionally but none the less effectively. Now the investor is afraid of the new securities that are needed for electric railway development, and the only way he can be attracted is for it to be made apparent that henceforth electric railways operators will not be needlessly handicapped in the application of common business judgment to their problems. There must be a combination between the public and the investor, looking to the development of transportation facilities, and the way to secure this is to give the company the benefit of the doubt in rate cases. The public will be benefited, not harmed, for company prosperity means community prosperity. The point raised by Mr. Brush is vitally important. It should be embodied in the law.

Rebuilding Interurban Cars to Reduce Weight

The Author Shows How Old Cars Can Be Remodeled to Approximate Modern Equipment in Weight and Appearance at About One-Half the Cost of New Bodies—Detailed Drawings and Data Show Special Considerations in Accomplishing This End

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MUCH discussion has appeared in the ELECTRIC RAILWAY JOURNAL and has been heard at various conventions relative to car design and construction, particularly with reference to new equipment. Very little has been said, however, regarding the old interurban equipment which is generally in evidence on the long-established properties. Few interurban companies are so fortunately situated that they can consign these old cars to the scrap heap and purchase new and modern cars to replace them. In many instances, then, this brings about the need to rejuvenate the old cars in a manner which will add fifteen or more years of life to the fifteen or twenty which they have already served and to do it in a way which will make their continued existence an economical procedure.

Rebuilding these old cars, of course, means the retention in service of wooden equipment. The writer is a strong advocate of steel cars, and what is said here is intended in no way to discourage their use, but merely to point out the economic aspects of rebuilding the wooden structures as compared with buying new modern all-steel bodies. The idea is simply this: If, by spending $3,000 or $4,000 on an old car, it can be put in approximately the same class with reference to weight, comfort and appearance as a new car costing $6,000 or $8,000, thereby adding from fifteen to twenty years to its life, it may be well worth while to consider the investment of this amount of money in rehabilitating and modernizing old wooden equipment. In such case the old bodies are made virtually into new ones at approximately 50 per cent less cost, and the remodeled car will have the same earning capacity as a new one.

In the maintenance of wooden cars in the past, there has been a tendency to avoid a first-class reconstruction job by adding on a brace here and a reinforcement there in the effort to overcome sagging at the middle or drooping at the platforms, and to lose sight of the greatly increased weight resulting from this patchwork or makeshift procedure. In the end, it will probably cost about as much as it would to have done a first-class reconstruction job in the first place. How this remodeling can best be accomplished is a matter which each master mechanic must decide for himself, taking into consideration the peculiarities of the car construction and the service requirements. However, the writer presents herewith data compiled for comparison of the weights involved in different methods of reconstruction work on various parts of the car body.

Different types of underframe construction and their comparative weights are indicated in items *T*, *U* and *X* appearing in the tables of data on page 429. The use of pipe spreaders for bridging in place of wood bridging as listed in item *T* brings about a reduction in weight on a 60-ft. interurban car of about 1000 lb. in favor of pipe. There is also the advantage of a reduced material cost and a less labor cost in favor of the pipe. With the wood bridging (item *U*), it is necessary to drill four holes in each angle iron, four in each piece of bridging, two in each sill and the steel plate on the side of the sill, for each set of bridgework, and also one hole in each sill and sill plate for the staybolt. Some time is also consumed in bolting the pieces in place. On the other hand, with the pipe bridge construction (item *T*) a single hole serves for spreaders, bridging and staybolt. In each case a sufficient number of ½-in. x 6-in. diagonal braces are placed on top of the sills to eliminate any lateral motion of the sills. This is not shown in the drawing, as it was assumed to be standard practice on all wooden interurban cars, and for the same reason no data have been given as to the weight. The body bolster, needle beams and bumpers aid the staybolts in tying the underframe together.

Another suggestion for weight reduction by eliminating part of the intermediate sills and using main sill construction for the remaining intermediate sills is shown in item *X*. The type of sill referred to is shown in item *Q*. These main intermediate sills are extended behind the bolster for a distance somewhat more than enough to counterbalance the load. They are riveted to the bolster and also supported underneath the bulkhead by a 4-in. x 6-in. angle iron, giving a uniform distribution of load on all sills. The comparative weights of the three above-mentioned types of underframe construction show a saving of 1046 lb. in favor of type *T* over type *U*, while the type *X* construction shows a saving of 2381 lb. over type *U* or 1335 lb. over type *T*.

SIDE FRAME CONSTRUCTION

Different methods for construction of the side framing of a car are shown with their respective weights in items *K-N* and *V-W*. Type *K* construction has been used on some of the old types of wooden cars and is still used at the present time. Type *L* construction is being used somewhat, adding on No. 14 gage black iron by screwing or bolting to the face of the siding, in order to brace up the framework of the car body and give the car the appearance of semi-steel construction, and also to eliminate the cross-bracing between side posts, as shown in item *V*. The

Data on Various Types of Construction Suitable for Use in Remodeling Old Cars—Union Traction Company of Indiana

PASSENGER CAR FLOORS—COMPARATIVE WEIGHTS PER SQUARE FOOT FOR DIFFERENT TYPES OF CONSTRUCTION

TYPE OF CONSTRUCTION	WEIGHT PER SQUARE FOOT								
	1⅛ Y.PINE	FLEXOTILE COMP.	TAR PAPER	MINERAL WOOL	CHANNEL WITH 2" MINERAL WOOL FILLING	LINK MAT	LINOLEUM	FLEXOLITH COMP.	TOTAL WT PER SQ. FOOT
A — 1⅛ Y.PINE, TAR PAPER—2 LAYERS, 1⅛ Y.PINE, 2½ MINERAL WOOL, 1⅛ Y.PINE	2.57 #		.27 #	4 #		2.88 #	INLAID .75 #		15.88 #
	2.57 #		.27 #						
	2.57 #								
B — 1⅛ Y.PINE, TAR PAPER—2 LAYERS, 1⅛ Y.PINE	2.57 #		.27 #			2.88	INLAID .75 #		5.31 #
	2.57 #		.27 #						
C — CHANNARCH WITH FLEXOLITH COMP, 2½ MINERAL WOOL, 1⅛ Y.PINE	2.57 #			4 #	1.72 #	2.88 #		4.185 #	15.35 #
D — CHANNARCH WITH FLEXOLITH COMP, 1⅛ Y.PINE	2.57				1.72 #	2.88 #		4.185 #	11.35 #

PASSENGER CAR FLOORS—COMPARATIVE WEIGHTS PER SQUARE FOOT FOR DIFFERENT TYPES OF CONSTRUCTION

TYPE OF CONSTRUCTION	WEIGHT PER SQUARE FOOT								
	1⅛ Y.PINE	FLEXOTILE COMP.	TAR PAPER	MINERAL WOOL	CHANNARCH WITH 2" MINERAL WOOL FILLING	LINK MAT	LINOLEUM	FLEXOLITH COMP.	TOTAL WT PER SQ. FOOT
E — BATTLE SHIP LINOLEUM, 1⅛ Y.PINE, 2½ MINERAL WOOL, 1⅛ Y.PINE	2.57 #			4 #			BATTLESHIP .9 #		21.21 #
	2.57 #								
	2.57 #								
F — BATTLE SHIP LINOLEUM, 1⅛ Y.PINE	2.57 #						BATTLESHIP .9 #		14.14 #
	2.57 #								
G — FLEXOTILE COMPOSITION, 1⅛ Y.PINE, 2½ MINERAL WOOL, 1⅛ Y.PINE	2.57 #	4½ #		4 #		2.88 #			18.52 #
	2.57 #								
H — ½ FLEXOTILE COMP, 1⅛ Y.PINE	2.57 #	4½ #				2.88 #			9.95 #

PASSENGER CAR FLOORS—COMPARATIVE WEIGHTS PER SQUARE FOOT FOR DIFFERENT TYPES OF CONSTRUCTION

TYPE OF CONSTRUCTION	WEIGHT PER SQUARE FOOT								
	1⅛ Y.PINE	FLEXOTILE COMP.	TAR PAPER	MINERAL WOOL	CHANNARCH WITH 2" MINERAL WOOL FILLING	LINK MAT	LINOLEUM	FLEXOLITH COMP.	TOTAL WT PER SQ. FOOT
I — ½ FLEXOLITH COMP, 1⅛ Y.PINE, 2½ MINERAL WOOL, 1⅛ Y.PINE	2.57 #			4 #		2.88 #		3.3 #	15.32 #
	2.57 #								
J — ½ FLEXOLITH COMP, 1⅛ Y.PINE	2.57 #					2.88 #		3.3 #	8.75 #

PASSENGER CAR BODIES.—COMPARATIVE WEIGHTS PER SQUARE FOOT FOR DIFFERENT TYPES OF CONSTRUCTION.

TYPE OF CONSTRUCTION	WEIGHT PER SQUARE FOOT							
	INSIDE FINISH	DIAGONAL SIDING	OUTSIDE POPLAR FINISH	BASE BOARD	SHEET STEEL	SHEET ASBESTOS	SHEET ASBESTOS	TOTAL WT PER SQ. FT.
K — ⅝ CHERRY: INSIDE FINISH; ⅝ Y.P. DIAGONAL SIDING; SIDE POST; 2×10 BASE; ⅝ POPLAR OUTSIDE FINISH	⅝ CHERRY 2.07 #	⅝ Y.P. 2.77 #	⅝ POPLAR 1.5 #	3×10 Y.P. 6.3 #				+40% FOR BASE BOARD 8.86 #
L — 2×10 BASE; 14 GA. SHEET STEEL OTHERWISE SAME AS K	2.07 #	2.77 #	1.5 #	6.3 #	2.61 #			+40% FOR BASE BOARD 11.47 #
M — ⅛ ASBESTOS MILL BOARD; SIDE POST; ⅝ SHEET STEEL					⅝ 5.24 #	¼ 2.8 #		7.84 #
N — ¼ ASBESTOS OTHERWISE SAME AS K					5.24 #		¼ 1.1 #	6.24 #

* ADD 40% FOR BASE
--* — EXCLUSIVE OF STEEL FOR BASE

PASSENGER CAR BODIES.—COMPARATIVE WEIGHTS PER SQUARE FOOT FOR DIFFERENT TYPES OF CONSTRUCTION

TYPE OF CONSTRUCTION	WEIGHT PER SQUARE FOOT								
	SHEET STEEL	CORK	2×2×¼ ANGLES 2@1.04 PER FT.	⅝×3½ BOLTS					TOTAL WT PER SQ. FOOT
Y — CORK; SHEET STEEL; 2×2×¼ ANGLE	⅝ 5.24 #	½ 2.62 #	8 @ 1.04 PER FT. 16 @ 1.04 EACH 1.04	8 @ .15 # EACH 1.2 #					747 #
	¾ 7.6 #	"	"	"					883 #
	"	¼ 6 #	"	"					10 #
	"	1 5.86 #	"	"					10.25 #

PASSENGER CAR SILLS—COMPARATIVE WEIGHTS PER LINEAL FOOT FOR DIFFERENT TYPES OF CONSTRUCTION.

TYPE	DIMENSIONS A	B	C	D	E	KIND OF WOOD	CU. INCHES PER LIN. FOOT	WT. PER CU. INCH OF WOOD	WT. PER LINEAL FOOT OF WOOD	WT. PER LINEAL FOOT OF STEEL	TOTAL WEIGHT PER LINEAL FT. OF ST. AND WOOD
O	5	7	⅜			Y.PINE	420	.022 #	9.240 #	17.85 #	27.09 #
P	6	8	⅜	7		Y.PINE	576	.022 #	12.672 #	12.75 #	25.42 #
Q	⅝	7	2@4.22			Y.PINE	241.5	.022 #	5.313 #	17.25 #	22.5 #
	⅝	8	2@4.22			"	293	.022 #	6.446 #	18.75 #	25.19 #
R	⅝	6	3@3.23			Y.PINE	184.4	.022 #	4.058 #	17.25 #	21.308 #
	⅝	7	3@4.23			"	225.7	.022 #	4.965 #	20. #	24.96 #
S	⅝	6	3@3.23			Y.PINE	368.8	.022 #	8.116 #	17.25 #	25.366 #
	⅝	7	3@4.23			"	451.4	.022 #	9.930 #	20 #	29.930 #

PASSENGER CAR UNDERFRAME BRIDGING—COMPARATIVE WEIGHTS PER SQUARE FOOT FOR DIFFERENT TYPES OF CONSTRUCTION

TYPE OF CONSTRUCTION

QUANTITIES & WEIGHTS OF DETAILS OF BRIDGING MATERIAL USED IN A 60×8½ FOOT CAR OR 510 SQ. FEET

T — TYPE O SILLS (SEE 5193); ⅝ ROD; 2½×2½×¼ WASHERS; TYPE P SILLS (SEE 5193); ¾ PIPE

¾ RODS	4×2½×2½ WASHERS	¾ PIPE	SILLS			TOTAL WT. REQUIRED	WT. PER SQUARE FT.
12 Pcs	102 Pcs.	92.8 FT	TYPE P 2@60 FT 3050 #				
153 #	90.3 #	104.86 #					
			TYPE O 4@60 FT 6501 #			9900 #	19.4 #

U — 3×3×¼ ANGLES & ⅝ BOLTS; 3×7 Y.P.; TYPE O SILLS (SEE 5193); TYPE P SILLS (SEE 5193); ¾ ROD

¾ RODS	2½×3½×6 ANGLES	3×7 Y.PINE	⅝×3½ BOLTS	⅝×7 BOLTS	SILLS		
12 Pcs	170 Pcs	135 CU FT	340	204	TYPE P 2@60 FT 3050 #		
153 #	425 #	609 #	106 #	102 #			
					TYPE O 4@60 FT 6501 #	10946 #	21.4 #

PASSENGER CAR BODIES.—COMPARATIVE WEIGHTS PER SQUARE FOOT FOR DIFFERENT TYPES OF CONSTRUCTION

TYPE OF CONSTRUCTION

WEIGHT PER SQUARE FOOT							
INSIDE FINISH	DIAGONAL SIDING	DIAGONAL BRACES	BASE BOARD	SHEET STEEL	LINOLEUM	CORK	TOTAL WT PER SQ. FOOT
⅝ CHERRY 2.07 #	⅝ YP 2.77 #	1½×3 YP 13.3 #	2×10 YP 2 #	#14 GA 2.61 #			22.75 #
2.07 #	2.77 #		2 #	2.61 #			9.45 #

V — SIDE POST; CHERRY; DIAGONAL SIDING; 2×10 BASE; 14 GA. SHEET STEEL; 1½×3 BRACES

W — LINOLEUM; 2×10 BASE; CORK; ⅝ SHEET STEEL

			2 #	⅝=.524 #	INLAID .75 #	¼=.43 #	8.42 #
			"	⅛=.765 #	"	"	10.83 #
			"	"	"	¼=.6 #	11. #
			"	"	"	1=.85 #	11.25 #

PASSENGER CAR UNDERFRAME, QUANTITIES AND WEIGHTS OF MATERIAL USED IN A 60×8½ FOOT CAR OR 510 SQUARE FEET.

¾ RODS	¾ PIPE	2½×2½×¼ WASHERS & NUTS	3×3×6×⅝ ANGLES	⅝×7 BOLTS	CROSS MEMBER TYPE Q. 5193	4×6×⅝ ANGLE	SILLS	TOTAL WEIGHT	TOTAL WT PER SQ. FOOT
12 Pcs	92.8 FT	32 Pcs	32 Pcs	80 Pcs	1 @ 5.371	2 Pcs	TYPE P 2@60 FT 3050 #		
153 #	104.86 #	17 #	122 #	60 #	270 #	203 #	TYPE O 2@60 FT 3250 #		
							TYPE Q. 4@15 FT 1350 #	8563 #	16.7 #

X — TYPE Q. 5193 BILLS 2×7 TYP & 7 CHANNEL; TYPE Q. 5193 2×7 TYP & 7 CHANNEL; TYPE Q. 5193 2×7 TYP & 7 CHANNEL; TYPE P. 5193 6×7 TYPE ⅝×7 STEEL PLATE; ¾ ROD; ¾ PIPE; 3×3×6×⅝ ANGLES; 2½×2½×¼ WASHERS; ½ OF TRUCK; BOLSTER; 4×6×⅝ ANGLE

use of either the cross-bracing between posts or the steel plate on the outside adds materially to the car weight, as is seen from a comparison of the weights in the tables on page 429. A number of railways have adopted a type of construction which is a combination of steel siding lined with Agasote or asbestos millboard for types *M* and *N*. Perhaps this method is more commonly used in the modern type of suburban and city cars of all or semi-steel construction. Few, if any, new or old interurban cars are built in this manner, for it is generally known that the heat insulating value of this construction is not as high as that shown in type *W*, where cork cemented to the steel siding and faced with plain linoleum is used. This linoleum is added as a flexible finish and can be stained to match any interior finish. The thickness of the cork or any other insulating material necessary would be governed by the geographical location and climatic conditions. Insulating values for various materials, except cork, is not available, but for Nonpareil corkboard the heat transmission is 6.4 B.t.u. in twenty-four hours per degree Fahrenheit difference in temperature per 1-in. thickness.

Side posts may be rigidly and neatly anchored to the steel siding plates by riveting angle plates to the sheet steel on each side of the post and bolting these through the post as shown in item *Y*. This may also be accomplished by riveting a U-strap around the post. By utilizing the type *W* construction the continuous truss plank can be omitted, thereby not only gaining a reduction in weight but also providing space for installing wider and more comfortable seats between the posts. This will be governed, however, by space between posts and whether reversible or stationary seats will be used.

Floor Construction

Several types of floor construction are shown in items *A-J*, together with their respective weights per square foot, not including sills. These weights are somewhat dependent upon the number of sills, since this governs the extent of sub-floor, mineral wool, etc., necessary. Separate weights are given for each item, even including the link aisle mats, making the data very flexible and applicable for almost any construction combination the rebuilder may select. Judgment, of course, must be exercised to select such combinations as will meet climatic conditions and assure a warm, comfortable car in the winter season. This is important as an item in fuel economy, as well as for the comfort of passengers. In choosing the floor material, the comparative wearing values of the various finished floors must receive consideration and the weight advantages balanced against the maintenance charges.

Storm Sash Consideration

The use of removable storm sash is an important item in the endeavor to minimize the weight of equipment to be hauled around. For example, the weight of the storm sash on a particular car is 380.5 lb. On forty-two cars the total storm sash weight would be approximately 8 tons. It has frequently been stated that it costs, on an average, $100 per year per ton in energy cost to operate a car. With this as a basis of figuring, and assuming the storm sash are on from Dec. 1 to May 1, a period of five months, the total energy cost for carrying these storm sash would be $333.30. If these were permanent storm sash and carried throughout the entire year, the energy cost would be $800. Thus the use of removable sash represents a saving in energy cost of $466.70, or 6 per cent on $7,800. From this it is obvious that it is quite worth while to avoid carrying this idle weight throughout the months when it is not needed, for it certainly would not cost $466 to remove, store, care for and replace the storm sash on forty-two cars. Furthermore, considerable additional work is involved in removing permanent storm sash when the cars are overhauled for painting.

In conclusion it should be noted that, when making such radical weight reductions in remodeling old cars, consideration must be given to the shifting of the center of gravity that results, and proper adjustment of the side bearings must be made.

New York City Fare Hearings Further Postponed

The only result of the reopening of the 2-cent transfer charge hearings for the Third Avenue Railway, New York, N. Y., on Sept. 10 was a further postponement until Nov. 12. Counsel for the company stated that he desired to secure operating figures for August, September and October. The postponement of this case from July 23 was noted in the ELECTRIC RAILWAY JOURNAL, of July 28, page 146.

The Third Avenue Railway is the only one of the New York City lines that has opened its transfer-charge case. The hearing on the application of the New York Railways has also been put over until Nov. 12, when it will probably be begun after the closing of the Third Avenue hearing.

Some advance may be made before this date, however, for the transfer-charge case of the Brooklyn Rapid Transit Company, although now not quite ready, is expected to be completed for a hearing scheduled on Oct. 1. Next in order at that time will be hearings on the 6-cent fare applications of the two Staten Island lines, the Richmond Light & Railroad Company and the Staten Island Midland Railway.

The only fare case that has been closed before the Public Service Commission for the First District is that of the New York & North Shore Traction Company, Roslyn, N. Y., which petitioned for a 7-cent fare for its lines in New York City. The final hearing on this application was held on Aug. 10. The commission, it is believed, will soon hand down a decision.

Fourth Annual Report of National Safety Council

The general manager of the National Safety Council reports a 68 per cent increase in membership for the past year, the active membership now being 3293. There was an income of $77,000 from dues and the surplus is $7,000. More than 5,000,000 bulletins have been mailed during the year. Six of the safe practices pamphlets have been issued, and six more are in process of publication. The fifth annual safety congress, held at Detroit, Mich., was attended by 2100 persons. The new danger emblem approved at that congress has since gained considerable popularity. The 1917 congress is being held this week in New York.

The National Electrical Safety Code from the Electric Railway Standpoint*—I

A Synopsis or Syllabus of the Code Prepared for the Convenience of the Busy Electric Railway Executive

By E. B. ROSA and W. J. CANADA
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FOR nearly four years past the electrical industry has been co-operating with the National Bureau of Standards in the preparation of the National Electrical Safety Code. The necessity for a code of this character, applying to construction, operation and maintenance of electrical equipment and outside distribution lines, has long been apparent to the users of such equipment, to manufacturers, and to those administrative authorities whose duties include the safety and reliability of electrical service. In response to the public demand the Bureau of Standards, under authorization received from Congress, undertook a thorough investigation of the subject, in which it has had the co-operation and assistance of a great many other agencies.

The code has indeed been developed through the fullest co-operation of all the various interests concerned, including the American Electric Railway Association and its subsidiaries. The work has been carried on through conferences, correspondence and field inspections. The material contained in the code as presented to the industry has thus been made to represent the best consensus of judgment concerning electrical practice. In order to further assure that the code is reasonable, adequate and practicable in its engineering requirements, it has now been submitted for "examination, trial and constructive criticism," in its second edition, published Nov. 15, 1916, and will be further revised after a year or more of use and field study in any respects that experience shows necessary.

The code as presented consists of four principal parts, as follows: Part 1, Rules for the Installation and Maintenance of Electrical Supply Stations and Equipment; Part 2, Rules for the Installation and Maintenance of Electrical Supply and Signal Lines; Part 3, Rules for the Installation and Maintenance of Electrical Utilization Equipment, and Part 4, Rules to Be Observed in the Operation of Electrical Equipment and Lines. The condensed summaries, begun in this issue and to be completed in a later issue, briefly outline the material contained in the rules of the several parts with special reference to their application to electric railway conditions. Since these summaries are necessarily brief, parenthetical reference numbers are given and these indicate the particular rules of the code which apply to the conditions under consideration. It is believed that a brief examination of these summaries will form a reasonable basis for an understanding by interested but busy persons, of the general scope and character of the rules themselves.

*For recent references to the National Electrical Safety Code see the following issues of the ELECTRIC RAILWAY JOURNAL: In 1915, April 3, page 673; April 17, pages 741, 750, 758; May 1, pages 825, 845; May 15, pages 939, 941; May 29, page 1036; June 19, page 1162; June 26, page 1189; Oct. 9, pages 697, 776; Oct. 16, pages 791, 839; Nov. 6, page 953; Nov. 13, pages 977, 996. In 1916, June 3, page 1048; Nov. 18, page 1059. In 1917, March 24, page 531.

Summary of Part I

Installation and Maintenance of Stations

Scope—The rules apply to generators, motors, storage batteries, transformers and arresters where under control of qualified operators and inaccessible to others (100). The conditions are outlined under which rules are to be applied, and when they are to be modified or waived (101).

Arrangement—For convenient use the rules are divided into nine sections, 10 to 18 inclusive.

Section 10. *Protective Arrangements of Stations and Substations*—The spaces in which electrical supply equipment is installed must be kept clear of dangerous processes, materials, gases or dampness (102), must be properly illuminated and provided with emergency lighting (103), and must be inaccessible to unauthorized persons (104). Floors must give good footing, floor openings and stairways must be protected (105), and adequate exits from such spaces (106) and safe fire-fighting facilities for the spaces must be provided (107).

Section 11. *Protective Arrangements of Equipment*—Electrical supply equipment is required to be so installed as to minimize the attendant life hazard and to comply with the rules (110), and the installation must thereafter be properly inspected and maintained (111). Non-current-carrying parts are required generally to be permanently and effectively grounded with given exceptions (113), grounding to be in accordance with the rules for grounding in Section 9. Current-carrying parts are required generally to be either guarded (115) or isolated (116), unless provided with adequate working spaces (114), and the voltage and other determining conditions are outlined. Equipment must also be sufficiently identified by suitable means (117).

Section 12. *Rotating Equipment*—Prime movers and, under given conditions, certain electric motors, must have automatic speed-limiting devices (120a, b), and no-voltage releases are required for certain field rheostats (120c). Prime movers or motors driving generators are required to have conveniently located stopping devices (120d, e). Guards are required for pulleys, belts and other moving parts (121). The character of guarding for live parts is specified (122), and

special rules given for grounding non-current-carrying parts (124). In locations where inflammable gas or flyings exist special enclosures are required for parts which spark or arc in operation (123). Special protection of windings is called for where exposed to steam or oil (125).

Section 13. *Storage Batteries*—Batteries above 50-kw.-hr. capacity are required to be in separate enclosures (130), ventilated to the outside of the building (131) and illuminated as specified (134), and to be set on well-drained, acid-resisting floors with suitable insulating supports (132). All conductors in battery rooms are required, if subject to corrosion, to be well coated with corrosion resistive material (135). Live parts of high voltage are required to be so separated or barriered that persons cannot readily make short-circuits between them (133).

Section 14. *Transformers, Reactances, Induction Regulators, Balance Coils and Similar Equipment*—Means must be provided for readily short-circuiting current transformer secondaries (140). Low-voltage circuits of instrument transformers and the cases of transformers in general are required to be permanently grounded unless identified and guarded as high-voltage parts (141). Transformers used with utilization equipment are required to be installed under station, line or utilization rules respectively, according as they are so located or of such voltage that they come within the scope of the respective rules (143).

Section 15. *Conductors*—Automatic cutouts are required to protect conductors against electrical overload (150), and mechanical guards or flameproof covering to protect against mechanical injury or spread of flames under certain given conditions (151). Even where mechanical disturbance is unlikely, effective isolation (153), guards, mats and other protection is specified according to given conditions of voltage and other factors, to safeguard persons in the vicinity of conductors (153). In gaseous surroundings conduit must be sealed to prevent entrance of gases (154). A number of special rules cover damp locations (154), taping of joints (157), use of flexible cords (155), and the safeguarding of temporary wiring (156).

Section 16. *Fuses and Other Cutouts; Switches and Controllers*—Detailed requirements are given for these protective and control devices, which must be accessible, must identify the equipment controlled, must not be subject to accidental operation (160), and must be suitably enclosed if in gaseous or other hazardous locations (161). Some of the places and conditions requiring use of switches or of disconnectors are specified (162). Arrangement for the locking or blocking of switches is required under given conditions (164), and air-break switches are specified for certain places (164).

Automatic cutouts are required for given conditions, and provision must be made for their safe disconnection in specified manner (165 and 166). The suitable isolation or shielding of fuses and circuit-breakers is required to avoid burning or striking persons in their vicinity (167). Grounding of exposed non-current-carrying metal parts of switches or cutouts is required under certain given conditions (168), and the special requirements for suitably guarding live parts of these devices are detailed (169), including the use of sufficient working spaces, isolations by elevation, barriers or mats, as the given conditions determine.

Section 17. *Switchboards*—The points of control are required to be readily accessible (170), the board to be well lighted (171), orderly in arrangement and with points of control well identified (173). It is required that arrangement of boards be such that temporary barriers may be placed about live parts while work is being done on the board, and suitable normal separation of parts of different potential is called for (174). Detailed requirements are given for the grounding of non-current-carrying parts (175) and for the guarding of live parts by isolation, barriers or adequate working spaces, according to the voltage and other conditions involved (176).

Section 18. *Lightning Arresters*—Provision for disconnection of arresters is required under certain specified conditions (181), and suitable location (180), ground connection (182), and guarding of live parts of arresters are specified (184). Metal frames or cases of arresters must be grounded unless marked as high-voltage parts and suitably guarded (183). Arresters installed with utilization equipment must comply with either line or station rules, according as they are so located or of such voltage that they come within the scope of such rules (185).

Summary of Part II

Installation and Maintenance of Electrical Supply and Signal Lines

The rules of Part 2 deal with matters of line construction and maintenance. These rules have necessarily received more extended consideration than any of the others because with a greater number of interests affected by a given type of line construction than is the case with station construction there has been a greater diversity of opinion concerning what constitutes acceptable practice.

As more experience is being accumulated through the many trial applications of the code to field practice, the reasonableness and usefulness of the code become more apparent, and many utilities are voluntarily adopting it as their standard for future practice.

Scope—The rules on overhead and underground lines cover both transmission and distribution lines and their auxiliary equipment. They are intended to apply to all new and existing installations except where for special reasons any rule can be shown to be unreasonable or impracticable. The time allowed for bringing existing installations into compliance with the rules is to be determined by the proper administrative authority.

Arrangement for Convenient Use—The rules of Part 2 are divided into ten sections, 20 to 29, of which 20 is general, 21 to 28 apply to overhead lines, and 29 applies to underground lines.

Section 20. *General Protective Requirements*—Lines are to be so installed, inspected and repaired as to comply with the requirements and minimize the life hazard (202, 204). The rules are minimum requirements, but their interdependency must be considered if any one requirement is increased (203). Lines are to be isolated or guarded, poles are not to be stepped too near ground, metal parts to be grounded if within reach

(205, 207). Switches, conductors and poles are to be so arranged and marked as to facilitate identification and safety in operation (206, 208).

Section 21. *Grades of Construction Required for Crossings, and Other Conditions of Hazard*—In order to provide a degree of strength in overhead lines comparable with the hazard involved, but limiting expense of construction to an amount warranted in minimizing the hazard, three grades of construction for supply lines and two for signal lines are prescribed.

Grade A, the highest grade of construction, is required for supply lines where they cross important railways and for supply lines above 7500 volts, where crossing, conflicting or on common poles above signal lines (211, 214).

A lower grade of construction, Grade B, is required for supply lines over unimportant railroads, or where supply lines between 5000 and 7500 volts cross, conflict or are on common poles above signal lines, or where supply lines over 7500 volts are in urban districts, either alone or crossing, conflicting or on common poles above other supply lines (212, 215, 217).

A still lower grade of construction, Grade C, is required in urban districts for supply lines between 750 and 5000 volts, either alone or crossing, conflicting or in common use above signal lines.

Two still lower grades of construction are specified for signal circuits crossing over railways, Grade D, where the railway is important, and Grade E, where spurs, branches or unimportant railways are concerned. Believing that there is a difference in the relative hazard involved at crossings over railroads, depending upon the importance of the road, the code states that unimportant railroads generally are those having not more than a single parallel signal circuit. Signal circuits carried over a different right-of-way for a part of their route, but concerned in the operation of the railway line, are included as parallel signal circuits within the intent of this paragraph. Several alternate methods of construction for telegraph and other signal lines not for public use and for supply lines exposing them are permitted. Signal lines may be considered either as signal lines for public use, or as supply lines of the highest voltage to which they are exposed; or they may be protected in such a manner as to prevent their voltage to ground from exceeding 400 volts (210, 213).

Where none of the foregoing hazards is present no special requirements are made as to strength of construction for supply lines (212, 216, 218, 219).

Section 22. *Loading Assumptions and Sags of Conductors*—The actual strength requirements for any particular installation are determined not only by the grade of construction required, on account of the hazard, but also by the wind and ice loading which is likely to be experienced in the locality. Three loading districts, designated as heavy, medium and light respectively, are outlined in a map of the United States given in Appendix A (220, 222).

It is assumed that heavy loading is the resultant at 0 deg. Fahr. due to the weight of the conductor plus the weight of a layer of ice ½ in. in radial thickness, combined with a transverse horizontal wind pressure of 8 lb. per square foot on the projected diameter of the ice-covered conductor. Medium loading is taken as two-thirds and light loading as four-ninths that of heavy loading at temperatures of 15 deg. Fahr. and 30 deg. Fahr. respectively. In some extreme cases these values would be about equal to that of the conductor normally, so it is further stated that the total resultant load shall in no case be assumed as less than 25 per cent in excess of the weight of the conductor.

Tables of recommended normal sags based on these loading assumptions are given in Appendix A for bare and covered medium and hard drawn, and also for covered soft-drawn copper wires of ordinary sizes in spans from 100 to 1000 ft., these sags varying according to the grade of construction. Tables of stresses and tensions in conductors corresponding to these various sags are also given.

Some limitations are placed on conductors as regards material, minimum sizes and lengths of spans (221, 223). Soft-drawn copper in the smaller sizes is considered as unsatisfactory and sizes smaller than No. 6 are prohibited, with recommendations that this size be limited to spans not exceeding 150 ft. in heavy loading districts.

Section 23. *Strength of Poles, Towers and Other Line Supports*—The assumptions upon which the transverse loads on supporting structures are calculated are somewhat different from those for longitudinal stress in conductors. In heavy loading districts the assumed horizontal wind pressure at right angles to the direction of the line is taken for cylindrical surfaces, as 12 lb. per square foot of projected area for Grade A, 7 lb. for Grade B and 4 lb. for Grade C, the pressure being computed for poles and towers without ice covering, while conductors supported are assumed to be covered with a layer of ice ½ in. in radial thickness (230). In medium loading districts the transverse pressure is taken as two-thirds and in light loading districts as four-ninths that in heavy loading districts.

A table of transverse wind pressures on conductors is given in Appendix B for various sizes of bare and covered conductors for combinations of grades of construction and loadings. Other tables in this appendix include those for vertical loads on conductors and resisting moments of poles. These will be found of great convenience in making rapid calculations when determining the strength of existing or proposed lines. Minimum requirements and other specifications are made for crossarms, conductor fastening (231), wood and reinforced concrete poles (235), and steel towers (234). Methods of meeting transverse strength requirements by the use of side guys are also specified (233, 235).

Section 24. *Clearances and Separations of Line Conductors.*—Minimum clearances and separations are prescribed for all characters of wire crossings, conflicts and common use of poles while adequate climbing and working spaces on poles, depending on the voltage and in some cases also on established practice, is provided in order to insure reasonable safety to workmen (240, 242, 246, 249). In all cases the necessary increase in clearance, as span length or voltage increases, is specified (241). Where conductors are strung to different sags the necessity of suitable modification is stated for the otherwise required vertical separation at the pole (244).

The required clearances are stated for conductors in conflicting pole lines (245). Certain clearances are required for conductors from buildings and bridges according to voltages and other given conditions (247, 248).

Section 25. *Supporting Structures and Attachments*—The proper clearance of poles from hydrants and curb lines is required (250). The use and proper method of installing guys and anchors, including use of guy insulators and traffic guards, is specified (251, 252). Transformers, regulators, lightning arresters, switches and lamps are to be installed so as not to obstruct climbing space, and so that they are safely accessible (253, 255, 256). Insulator ratings are to be indicated by markings, and at locations where hazards are considerable the insulators are to be of greater dielectric strength if subjected to greater stress than elsewhere in the line. Test requirements are also given (254). Tree trimming is called for to prevent mechanical injury to live conductors (257).

Section 26. *Crossing of Supply Lines with Railways and with Signal Lines*—This section is a segregated and conveniently arranged specification for crossings of supply lines with railways and with signal lines. It contains all rules specially pertaining to these subjects, and reference is made to general rules to be found in previous sections that have a bearing also on crossings. Such clearance and separation requirements as apply, although fully given in Section 24, are here repeated in a form convenient for ready reference when considering this important phase of crossing construction. Underground and underbridge crossings of supply lines beneath railways are covered as well as overhead crossings.

Power, railway and signal engineers as well as inspectors can find in this section, either directly or by reference, the necessary rules and specifications relating to these types of crossings.

Section 27. *Overhead Supply Lines (or Signal Lines Which Have Taken on the Character of Supply Lines) in Various Situations*—This section is devoted exclusively to overhead supply lines in various situations in both urban and rural districts, and includes signal lines which have assumed the character of supply lines and railway feeders and contact conductors. As in Section 26, reference is made to previous sections for general requirements, while clearances and special features are given in detail. Rules for all possible conditions where only supply lines are concerned, including crossings, conflicts and common use of poles by different supply lines, are given either in detail or by references to preceding sections. Parallel pole lines are required to be properly separated. Where this is not practicable placing the lines on the same poles is recommended (270a). Utilities should agree upon and maintain a standard of levels (270b). Proper specified clearances of poles from fire hydrants and signal pedestals is to be maintained (270c).

Section 28. *Signal Lines at Crossings, Conflicts and Commonly Used Poles*—This section contains practically all the rules of the code applicable to signal line construction except for such signal lines as have taken on the character of supply lines, which are treated under Section 27. But few references are made to previous general sections, as signal lines are exempt from most of the general requirements for supply lines. Rules somewhat less severe than for supply lines cover in detail minimum requirements, materials and sags for signal lines crossing railroads. The crossing requirements vary somewhat, depending upon whether the crossing is over important or unimportant railroads. Special attention is given to the subject of common use of poles by supply and signal lines, as this type of construction is considered preferable to separate conflicting lines. Such rules as are necessary are given for signal lines alone or where concerned only with other signal lines.

Section 29. *Manholes, Handholes, Splicing Chambers and Ducts, Conductors and Equipment*—The duct system is required to be so laid out as to avoid short curves and to secure proper drainage (292d). Manholes are required to be conveniently accessible, of sufficient strength and to have sufficiently large openings and working space (292b and c). Covers must require a tool for removal, and openings must allow mechanical guards to be used. The duct arrangements must be such that conductors may be installed and maintained without mechanical injury, and sufficient distance must be provided between ducts for signal and those for supply conductors.

Supply and signal conductors are required to be maintained in separate conduits and manholes with given exceptions (295). Cables must be suitably identified, sufficiently accessible from the working space, properly supported and suitably protected against arcing (296). The necessary mechanical protecting is outlined for connections to overhead lines (297). Joints are required to be so arranged as to leave no bare current-carrying parts exposed in manholes, and cables of different voltages are required to be separated as far as practicable (297).

Customer-Ownership Plan on Byllesby Properties

Sales of preferred stock in August in the home territories of the Byllesby utilities prosecuting the customer-ownership plan exceeded $103,900 par value, the purchasers numbering 252 citizens, of whom seventy invested on the partial-payment plan. At the Oklahoma properties the initial offer was made to the public in the latter part of July, but it was well into the following month before the 2300 inquiries received from a population of 176,000 could be handled on a systematic basis. At Ottumwa the initial offer was made on Aug. 22. Plans are being made to start the customer-ownership plan early in September at the properties served by the Arkansas Valley Railway Light & Power Company, centering at and including Pueblo, Col.

A jitney bus service from the center of the city to the Federal Army Camp 6 miles south has been announced by the Louisville (Ky.) Jitney Bus Service Company. The company will also operate a line to the southwestern section of the city, the routes to be those not ordinarily traversed by the street railway. Fares will be 10 cents each. Regular schedules, it is announced, are to be maintained. A. D. Hollet is president of the company.

Reduction of Railway Operating Costs by Use of Automatic Substations

While the Labor Saving Is Most Conspicuous, There Are Other Sources of Economy Which Deserve Careful Consideration

By W. D. BEARCE

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During the past three years it has been clearly demonstrated that the automatic substation is capable of making substantial savings in the cost of railway operation. A dozen or more equipments have been installed on no less than seven different railway systems in various parts of the country and are now in operation. In addition to these, approximately thirty equipments are under construction in the factory of a single manufacturer.

Although the automatic substation has been previously described in the technical press, it may be of interest to outline the functions of this equipment. Briefly, the automatic-control apparatus is designed to do the work of the substation operator, and in addition automatically to limit the amount of current taken from the machine. The starting up and shutting down of the substation machinery is entirely taken care of by electrically-operated switches which are controlled by a motor-driven drum controller through suitable master relays, eliminating entirely the services of the attendant except as may be required for periodical inspections. The portion of this equipment designed to secure overload protection is a load-limiting resistor which is automatically inserted between the direct-current machine and the station bus when excessive peaks are drawn by reason of high acceleration on cars or locomotives or due to short-circuits occurring on the line. Where individual feeder protection is required a portion of the resistance is inserted in the outgoing feeders.

When Automatics Are Most Feasible

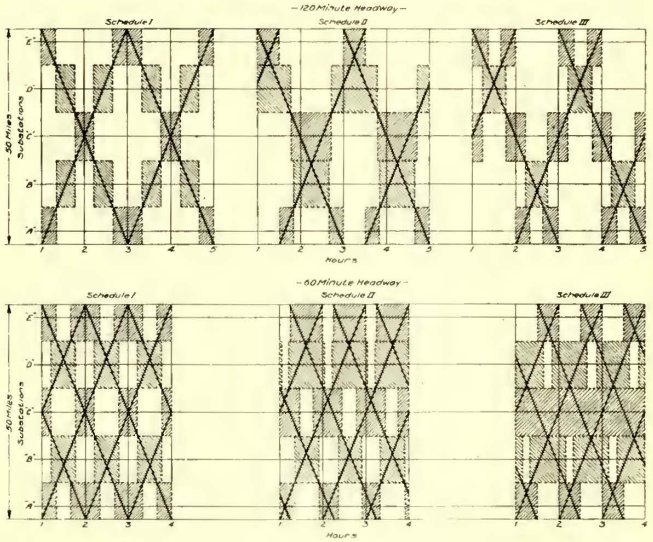
The accompanying train sheets have been prepared to show graphically the conditions under which the automatic substations operate. They represent hypothetical conditions on a 50-mile line, with one-hour and two-hour headway, and with several layover periods. Horizontal, light lines represent substations, "A" to "E," equally spaced, and the heavy diagonal lines are the time-distance lines for the cars. The shaded areas show the energy output from the several substations, their vertical dimensions being proportional to the power output, and their horizontal dimensions to the duration of that output. These areas also indicate when and for how long the substations are in action.

The sheets are drawn for no layover, and ninety-minute and sixty-minute layover for the two-hour headway, and for no layover, fifteen-minute-forty-five-minute, and thirty-minute layover for the one-hour headway. They show that of the assumed conditions the one-hour layover is most favorable for automatic operation with the two-hour headway, and no layover is best with the one-hour headway.

The specific items of operating costs upon which savings have been made are: First, reduction in cost of labor by cutting the operating force; second, reduction in the cost of power by eliminating light-load and no-load losses.

The most conspicuous saving which can be secured by automatic control is the item of expense for substation attendants.

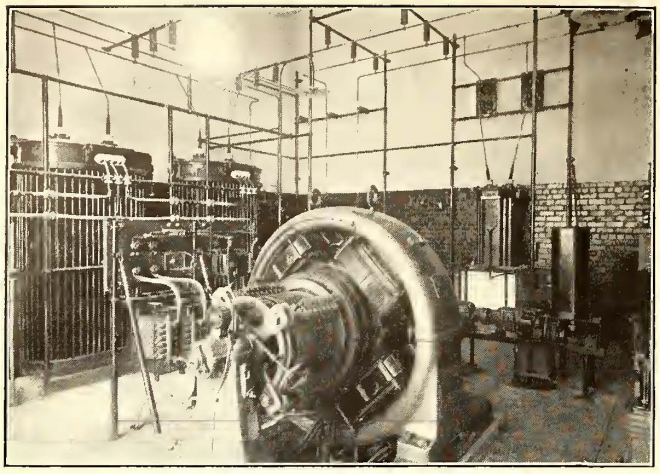
Salary for these operators varies from $50 to $75 per month, and men are increasingly more difficult to



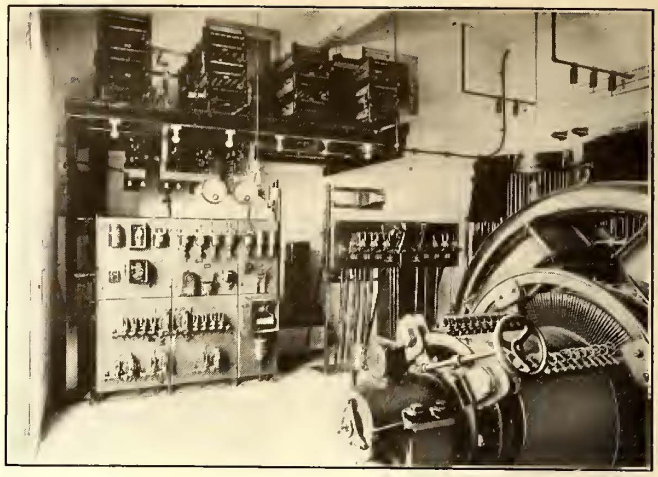
TRAIN SHEETS FOR INTERURBAN RAILWAY, SHOWING RELATIVE ADAPTABILITY FOR AUTOMATIC SUBSTATIONS

get at even higher figures. At least two men are required per station for the day and night shifts, and on some roads it is customary to employ a relief man, in case of sickness or other emergency. With the automatic substation it is possible to employ one day and one night inspector for all of the stations on the ordinary system. One or the other of these men is always available in case of emergency, and the two will have ample time to make inspections at stated intervals and keep the equipment in proper adjustment. In the case of the Des Moines City Railway it has been stated that two inspectors will have ample time to look after the operation of sixteen automatic converter stations which will eventually be installed. In view of the present shortage of labor, this item should be especially attractive to the operating company.

The saving in the cost of power is also an important item, whether energy is purchased, or manufactured in the railway company's plant. On the ordinary interurban system it is customary, and in fact necessary,



BRENNAN AUTOMATIC SUBSTATION, INTER-URBAN RAILWAY, DES MOINES, IOWA, INTERIOR



AUTOMATIC CONTROL EQUIPMENT IN SUBSTATION OF GRAND RAPIDS, GRAND HAVEN & MUSKEGON RAILWAY

to operate one machine over a period of at least eighteen hours per day. On a system of this kind, operating cars, for example, under a two-hour headway, the time of actual running for the substation machines can be reduced to about seven hours per day. Automatic operation thus eliminates the no-load losses on converters and also on the transformers during periods of eleven hours out of the eighteen.

In addition to this saving, the effect of the load-limiting resistance is to reduce instantaneous peaks caused by excessive drafts of current, upon starting trains, so that the machinery is fully protected from flashovers and abnormal overloads. This feature also serves as a check on careless motormen on occasions when they attempt to accelerate their cars too rapidly. The heavy current demand immediately brings the load-limiting resistance into the circuit, and automatically reduces the trolley voltage.

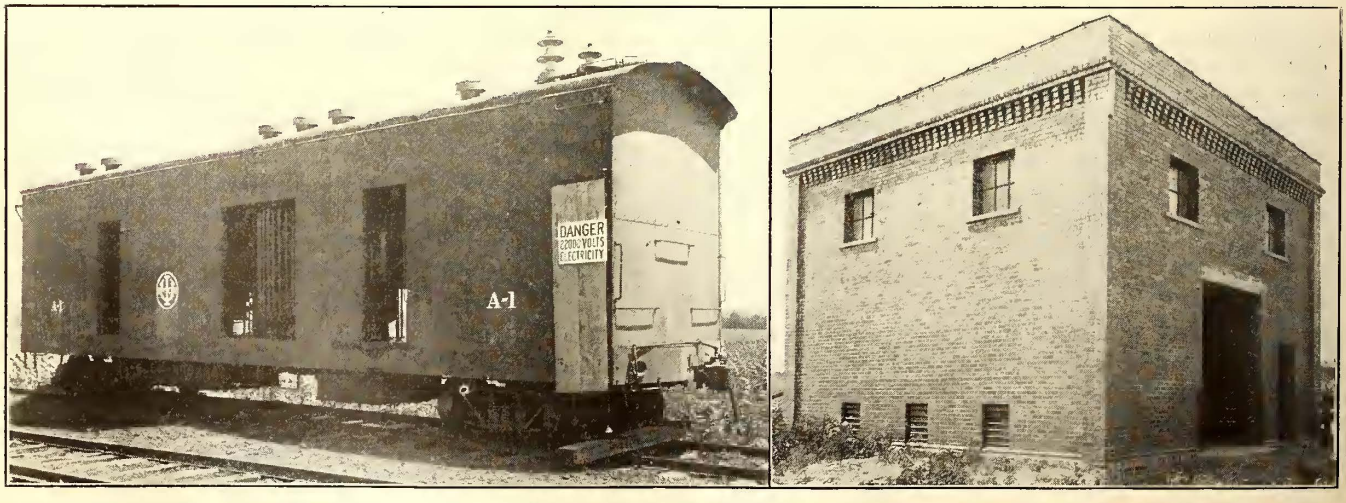
Advantages also result from the decreased time of running and the beneficial cushioning effect of the load-limiting resistance. The commutators of the synchronous converters soon acquire a durable polish, and thus become capable of long periods of service without attention.

On city or suburban systems operating cars on a more frequent headway the power savings are somewhat less. Where power is required throughout the day, two or more units may be found in the substations, and automatic control makes it possible to supply power from a single machine during normal load conditions with this machine shut down when no trains are on the division. The spare machine may be automatically cut in and out during rush hours to assist in handling sustained peaks. In many instances, the protection afforded by the load-limiting resistance so reduces the instantaneous peaks that one machine will carry the load. In any case, the improved load factor will help out the power station, and, where energy is purchased, will constitute an argument for more favorable power contracts.

Equipment Cost May Be Reduced Also

Further interest attaches to this apparatus, from a money-saving standpoint, due to the fact that a number of cases have been investigated in which it was possible to remove enough excess feeder, after the installation of properly located automatic substations, to pay for the entire cost of the automatic-control equipment. This condition is due to the fact that in the progress of natural growth city systems have usually found it more economical to install additional feeder than to construct and maintain new substations.

On systems where there is insufficient feeder to cope with a rapidly increasing traffic, the railway management is faced with the necessity of putting up additional feeders or building new substations. Assuming auto-



PORTABLE AUTOMATIC SUBSTATION AND EXTERIOR OF BRENNAN SUBSTATION, INTER-URBAN RAILWAY, DES MOINES, IOWA

matic operation, new substations will usually prove much more economical than new feeder metal. With the present high price of copper, and the question of operators' wages disposed of by automatic control, the excess feeder becomes "money in the bank."

In addition to this actual cash asset the operating company has the satisfaction of knowing that less power is being used up in overcoming the resistance of the feeders.

Equipments are under construction for automatic stations ranging in capacity from 200 to 1500 kw. It may thus be seen that the possibilities of reducing operating expenses are not limited to the interurban system where it was first tried out, but may be secured as well on city systems operating frequent service.

As an example of the specific savings which can be made on a typical interurban road, the following table has been calculated as an engineering illustration, based on a hypothetical road having four substations of 300 kw. capacity each, and operating a car service on a 2-hr. headway. The savings indicated in this calculation are significant.

	Hand Operation	Automatic Operation
Headway between trains, minutes	120	120
Number of substations	4	4
Capacity of each substation, kilowatts	300	300
Actual time machines operate per day, hours	18	7
No-load losses per substation, kilowatts	12	...
No-load energy losses per day per substation, kilowatt-hours	132	...
Cost of energy at substation, per kilowatt-hour, cents	1	1
Value of energy saved per day per substation	...	$1.32
Value of energy saved per year per substation	...	$482
Number of inspectors or operators	8	2
Wages of each operator or inspector per month	$65	$65
Total wages per year	$6,240	$1,560
Value of wages saved per year	...	$4,680
Value of energy saved per year	...	$1,928
Total saving per year	...	$6,608

In the ELECTRIC RAILWAY JOURNAL for Jan. 13, 1917, most interesting figures were submitted regarding the Des Moines city and interurban equipments, showing the cost of installation and possible savings. Further evidence has been disclosed in a description* of the Milwaukee Electric Railway & Light Company's new station, operating at 1200 volts D.C., by means of which approximately $1,700 per year is being saved.

Another interesting system which is now operating a 500-kw. automatic substation is the Grand Rapids, Grand Haven & Muskegon Railway, which is largely fed from an overrunning third-rail. This station is located at Spring Lake, Mich., and was put in service in May of this year.

While all automatic railway equipments in operation thus far control synchronous converters, the adaptation of this apparatus to motor-generator sets is a very simple matter.

The field of application of the automatic station is not limited to railway substations, but may be extended to lighting and industrial units as well. In fact, equipments have been built to control water-wheel-driven generators and one at least to operate a synchronous condenser.

From the standpoint of the railway management which is faced with constantly increasing cost of operation, the automatic substation is one of the most effective means of reducing operating costs, and the whole subject deserves a careful study with reference to each particular case.

*ELECTRIC RAILWAY JOURNAL, July 14, 1917.

Women Employees on Electric Railways

Details of Uniform Designed in This Country for Their Use—Conditions of Employment

IN view of the extended employment of women in electric railway service abroad many electric railway executives are looking forward to the time when such employment may be necessary in this country. The ELECTRIC RAILWAY JOURNAL has, therefore, published all available information on the subject with a view to assisting in the making of plans for the future. Among the articles published one of the most recent and informing was that appearing in the issue for Sept. 1, page 351, where the successful employment of motor-women in Rome, Italy, was described. Photographs of women employees were reproduced primarily to show the details of the uniforms worn.

One important company which has given careful study to the possible employment of women has prepared specifications for a uniform for surface car conductresses. The suit will comprise coat, skirt and cap, and will be made of khaki cloth. The coat will have a straight military effect, buttoning with ten large regulation buttons. There will be a convertible collar and the coat will be reinforced around the shoulders in a substantial manner. Across the back will be a belt fastening with three small regulation buttons on each side. There will also be a wrist strap on the sleeve with two small regulation buttons. There will be two side and two breast pockets, 1-in. deep, with reinforcement on the left breast for the badge. The skirt will be a plain gored skirt effect, belted around the waist, and will be worn about 7 in. from the ground. There will be two inside front pockets, straight cut. A plain military cap will be worn.

While the cost of the above uniform cannot as yet be determined accurately from the sample, it is believed that in large lots they can be made for $11 per suit and that the caps can be had for $1.75.

This company, in considering the employment of women conductors, has as yet only thought of this as an emergency measure if men cannot be obtained. Consideration has also been given to the use of women in emergency as porters, fare-box attendants, car cleaners, clerks, telephone operators and receiving clerks. It has been thought that it would be wise to employ only women between the ages of twenty-four and thirty-five, and that they should be given the same wages as men now receive for doing the same work. In the state in which this company operates the law requires that women be not compelled to work more than ten hours per day, or fifty-four hours per week, and they must have one day off each week. If women conductors are employed it now seems that they should be given separate work, and separate rating from the men, with separate accommodations at carhouses. As yet no physical requirements for women have been fixed, but they would, of course, require substantially the same training as men.

This subject is so vital at present that it is suggested that companies which have any helpful information regarding it should place this at the disposal of the industry generally. It is to form a topic for discussion at the coming conference of the American Electric Railway Association.

Why Present Fare Regulation System Should Be Changed

Additional Material Presented by President Brush Before Massachusetts Investigating Commission to Show Why Electric Railways Should Have Limited Power to Initiate Tariffs—Unfortunate Aspects of Present System

A REVERSAL of the present regulative policy of Massachusetts with respect to rate-increase procedure was advocated by M. C. Brush, president Boston Elevated Railway, at a hearing on Sept. 6 before the legislative recess commission which is investigating the present electric railway economic situation. A preliminary report of Mr. Brush's remarks was published in the Electric Railway Journal of Sept. 8. In place of the present protracted proceedings necessary before a rate increase can be authorized, Mr. Brush urged that companies be granted limited powers to initiate new tariffs, subject to corrective restriction by the Public Service Commission. Such a plan, he said, would do away with the burdensome delays at present sustained by the companies and would immediately insure the development of vitally important facilities and service improvements which cannot now be obtained because of the great difficulty of enlisting capital in the industry.

Causes of the Present Unfortunate Situation

With an elaborate system of laws for the purpose of covering each and every detail of the electric railway industry, and with a long list of able citizens in the rôle of public service commissioners, the question naturally is asked how the railways have got into their present unfortunate condition. Among the causes, Mr. Brush said, are the following:

1. In most cases the 5-cent fare was never ample to provide necessary service, sufficient revenue to care properly for depreciation and obsolescence, a fair return on the money invested, and a reasonable surplus for emergencies.

2. In endeavoring to create and maintain good terms with the public, unwise and improvident concessions have been granted. There have been too many cases of doing this, that or the other thing for expediency's sake. Furthermore, the companies in many cases have been afraid to stand up and state what was right and what was wrong.

3. At the time of the original creation of commissions it was believed that with improved methods and the growth of communities rates could properly be reduced. The minds of several years ago did not conceive the tremendous increases in the costs of labor and material and money. Moreover, it has been found in many cases by actual experience that after a community reaches a certain degree of development, the kind of service necessary requires larger investment per passenger carried than for service when the community was smaller.

4. The economic situation is always elastic, but the law is rigid. The electric railway situation is constantly changing, but the law providing for the supervision of railways is so rigid that the system fails to be sufficiently flexible to respond promptly and adequately to the varying conditions.

What the Present Rate Procedure Demands

Under the present system, when an electric railway deems it necessary to revise its tariff, it must file with the commission its new rates. Then the commission must hold public hearings, after which it can authorize such of the changes or such portions of the changes as it deems expedient.

No matter how self-evident the necessity for the changes may be, none can be made until there have been hearings, special examinations and investigations, and then only such portion of the request is granted as the commission may think proper, basing its finding upon specific evidence of the company's actual past experience and proof. Of course, the increase cannot be retroactive, and therefore from the time the necessity exists until the hearings are closed and the order of the commission is issued the earnings must be insufficient and the return or service suffer.

Moreover, in order to secure such absolute figures as will justify an increase under the present system, the company must necessarily have previously failed to earn a reasonable return. It is inherent, therefore, in the present system that, instead of an electric railway being kept successful and healthy, it first must become actually unsuccessful and ill before any remedy can be secured.

How the Days Pass Before Relief Is Secured

The Massachusetts Public Service Commission has in a number of cases granted increases in fares, but in substantially each case a considerable period of time necessarily elapsed between the time of the petition by the company and the time authority had been granted by the commission for any portion of the increase. Under the wording of the present act such suspension of revised tariffs and lapse of time is necessary, but in all such cases the company in the first place, in order to prove its case, was compelled to let occur a condition of earnings insufficient properly to maintain its credit before it petitioned for increases. In addition to such time as had already elapsed, therefore, the suspension of the suggested tariff by the commission to permit the remonstrants to prepare their case merely increased the period during which the company was earning insufficient net income.

From the time the public service commission act took effect on July 1, 1913, up to June 30, 1917, the various companies filed schedules of increases in fares, with elapsed time before being granted as shown in the table on page 439 opposite.

According to Mr. Brush, the present method has created a condition where the company, on account of its efforts to operate efficiently its property, is constantly opposing demands of the public in hearings before the Public Service Commission and elsewhere. It seldom is in a position to agree that any changes or improvements in service are wise unless they actually do not decrease net revenue. It is constantly arguing in hearings against the request of petitioners. Such a situation makes both petitioners and the commission feel that the company is antagonistic to them and is not willing to assist in the combined efforts to improve the transportation conditions.

The company fully realizes that its purpose is the furnishing of good, efficient, reliable transportation for the community in which it operates, but in its efforts to fulfill to the highest degree possible its function and give to the car-rider that transportation which is so absolutely essential it must also keep its property in a successful condition. The fact is too often lost sight of that the interests of the company and the public are essentially identical and that neither can be served properly at the sacrifice of the other's interests.

As a matter of actual fact, every burden which is placed on a public utility must necessarily, to a certain degree, eventually be transferred to the car-rider, either in increased cost of transportation or—if this is impossible, due to inability to raise rates—then in poorer service. The railway man is no more able than the farmer to make two and two equal five. When the farmer is confronted with increased labor and material cost, he meets it by an immediate increase in his price or the discontinuance of unprofitable production, while the railway man, because of his inability to increase his rate, must necessarily eventually take it out of his service.

An electric railway is practically manufacturing and selling transportation. The minute it sells its product at less than cost and is unable to pay a fair return on capital which has been furnished, investors will cease to buy its securities. This is exactly what has happened in Massachusetts. The investors have already lost so much in income and in the market value of their investments that they are reluctant to invest money under the present system. Yet capital must be secured or the communities will suffer.

Is Commission Regulation of Electric Railways a Success?

There can be no question, in Mr. Brush's opinion, that there have been many advantages in commission regulation. The system has undoubtedly accomplished a great deal, but unfortunately it has cared for but part of the situation which it was created to cover. It has prevented the issuance of other than genuine securities; has prevented abuses, careless operation and discrimination; has compelled a correct and honest keeping of accounts, and has forced public utilities under its jurisdiction into making public such information as has been beneficial. Yet it has failed to perform one of its most important functions in its failure to provide for a reliable method of adequately increasing the transportation facilities of the commonwealth.

There is a tendency on the part of all concerned not fully to realize the tremendous importance of excellent transportation service. The question of fares is of secondary consideration, as long as they are anywhere nearly within reason, as compared with the importance of good service.

It is scarcely conceivable that almost any car-rider would not be willing to pay 1, 2 or 3 cents more per day for good, reliable transportation, than he would for poor transportation. A passenger is willing to pay for good transportation if he gets it. While a small increase in rates means comparatively little to the individual, it does mean in the aggregate a substantial sum which not only permits better transportation but so assures the investor of a reasonable return that he is not only willing to furnish funds for improved facilities and extensions, but is willing to furnish these funds at a comparatively low rate of return.

Principles of Suggested Remedy

To find a really constructive solution, Mr. Brush said, it will be necessary to get down to fundamentals and completely reverse the present system of commission regulation in so far as fares are concerned. The relations between that portion of the public who are car-riders and that portion of the public who are investors must be equitably regulated the same as all other political and economic relations are governed. The Public Service Commission should be a commission of supervision and not of administration, for there cannot be successful administration of private capital by public authorities without direct responsibility to the person who furnished the capital that makes the business possible.

The investor must be permitted to run his business according to his best judgment, and sell his goods at such prices as will render a reasonable return on the investment, provided he conducts himself at all times in accordance with the law of the community. He must be so allowed at least until he is shown to be in error by a proper authority, and then the same authority should prescribe the changes he must make in his practices or administration and assure the conserving of his interests.

In short, Mr. Brush stated, electric railways should have the right to initiate new tariffs, these to be subject to later change by the commission if found necessary. His full plan along this line was given in detail in the ELECTRIC RAILWAY JOURNAL of Sept. 8, page 400. The commission should continue, as at present, to keep informed as to the situation and the service of the companies, so that when a new tariff is filed it will know reasonably well the real condition and practices of the company.

Time Consumed in Securing Fare Decisions

Company	Petition Filed	Action	Elapsed Time, Days
Providence & Fall River	Jan. 1, 1914	Granted	71
Middlesex & Boston	July 3, 1914	Part granted	117
Norfolk & Bristol	March 12, 1915	Part granted	149
Blue Hill	March 19, 1915	Part granted	133
New Bedford & Onset	April 14, 1915	Part granted	147
Berkshire	(Company withdrew petition)		
Bay State	Sept. 7, 1915	Part granted	358
Case reopened	May 16, 1917	Part granted	47
Massachusetts Northeastern	Oct. 1, 1915	Part granted	379
Bristol & Norfolk	Dec. 20, 1915	Part granted	254
Norwood, Canton & Sharon	Oct. 27, 1916	Granted	186
Worcester & Warren	Jan. 17, 1917	Part granted	71
Ware & Brookfield	Feb. 21, 1917	Granted	36
Concord, Maynard & Hudson	April 5, 1917	Part granted	50
Milford & Uxbridge	May 3, 1917	Granted	97
Middlesex & Boston	May 24, 1917	Part temporarily granted	77
Holyoke	June 5, 1917	Pending	?
Boston & Worcester	June 25, 1917	Pending	?
Norton, Taunton & Attleboro	June 29, 1917	Pending	?

It is doubtful if any temporary relief which might be suggested would meet the situation, for the permanency and also the sufficiency of any relief are the only things that will bring back into the railway field the much scarred and impoverished investor who has seen both his income and the value of his investment disappear.

What is done to remedy the situation must have a decidedly strong element of permanency, not only to invite new private capital now, but to make it reasonably clear in the invitation that a repetition of the present situation will not occur again in the near future.

After the war is over there will be a world-wide and keenly competitive market for capital, and it is manifestly for the best interests of the commonwealth to provide for the development of its own transportation industry—the very backbone of its prosperity—by making the investments of its citizens' savings in its railways so secure that their entire savings will not be forced into other investments or foreign markets.

Recommendations by President Brush

In conclusion Mr. Brush summarized his opinions in the form of the following recommendations:

1. It should be constantly realized that substantially all capital stock of electric railways has been issued and the funds invested in the property in this commonwealth under the authority and inspection of the Railroad Commission or Public Service Commission, and therefore the usual charge of watered stock is not applicable to Massachusetts electric railways. Therefore substantially the amount paid at the time of issuance for stocks and bonds is the proper one on which to consider a fair return.

2. The importance of the industry to the community makes it imperative that some permanent means be provided either by private or public funds for its constant development, with respect to both extension of lines and enlargement of facilities on existing lines.

3. There need be little change in the laws with respect to the inspection and supervision of the companies by the Public Service Commission so far as service, safety, etc., are concerned. The change that seems necessary to effect improved conditions in the electric railway industry in the State concerns that portion of the present act which deals with the fare-regulatory powers of the commission.

4. Every burden or obligation such as paving, taxes, contribution to abolition of grade crossings, etc., becomes a part eventually of the operating expenses of an electric railway, and every element which tends to reduce the gross receipts, such as unrestricted operation of jitneys, etc., also eventually becomes the car-riders' burden. Therefore, to the extent that the legislative commission deems it expedient to recommend modifications in the present acts with a view toward increasing the net returns of companies, to that extent if the legislature approves, will fares be lower.

5. Various boards of public authorities such as boards of aldermen, superintendents of streets, boards of selectmen, highway, park, bridge and other commissions, etc., have jurisdiction over some detail or other of electric railways. It would be advantageous to all concerned to have the Public Service Commission authorized to act in the capacity of a board of appeal or supervisory board with very full powers on all matters where at present final jurisdiction rests with these other authorities.

6. The present unsatisfactory financial condition and service of substantially all electric railways in the State is evidence of the necessity of some prompt and constructive action whereby good service can be assured.

7. In order to restore the necessary confidence of investors in the continuity and integrity of a fair return, the companies should have limited powers to initiate their tariffs, subject to the corrective restriction of the Public Service Commission, with an opportunity to appeal to the courts for adjudication of differences in opinion.

8. Any solution of this problem must recognize that continuity of return on investment is important to the car-rider, and that merely temporarily improving the situation by increases in rates of fare will not be sufficient again to induce private investors to supply funds for extensions and improvements.

9. In every case where the credit of an electric railway is so impaired as to compel the payment of a rate of interest higher than the rate would be if the credit of the company were good, for either refunding existing securities or for providing funds for extensions, betterments, etc., the car-rider eventually suffers by paying more for the actual service than is necessary.

10. The only way first-class electric railway service can be assured to the car-rider, regardless of whether capital through private ownership or public ownership is employed, is for the fare to be sufficient to pay a proper rate of interest, except that if public funds are employed any deficit below the amount necessary to pay interest on bonds issued for such public purposes must be made up from taxes on the community served.

Creating Interest in New Freight Terminal

Upon the opening of its new East Side freight terminal, which was set for Sept. 4, the Detroit (Mich.) United Railways sent out a semi-formal invitation to attend the opening to the patrons of the company and to Detroit shippers, and consequently the affair was largely attended. Representatives from several electric lines with which the D. U. R. connects were also present. An illustrated article on this terminal appeared in the issue of the Electric Railway Journal for Aug. 11, 1917, page 219.

The arrangements for the opening were necessarily simple, so as not to interfere with business. Floral decorations were supplied to add to the attractiveness of the station and the visitors were entertained by being shown through the entire plant. W. S. Rodger, general traffic manager, states that all who attended were enthusiastic in their praise of the facilities provided for handling traffic and that they assured the company of a very large increase in the amount of business which it would be called upon to handle.

The Louisville (Ky.) Railway, in connection with a three-day baby show at Fontaine Ferry Park, in the west end of the city, arranged for transportation of the baby carriages from the park lines to the park and return. Mothers who wished to have their babies' vehicles transported so informed the conductors and the go-carts were then moved on a special.

Higher Fares Benefit the Public

This Point Should Be Emphasized in Publicity Campaigns for Higher Fares—Without Adequate Income the Company Cannot Give Adequate Service or Make Needed Extensions or Improvements

By IVY LEE

IT IS most important that the electric railways should cultivate in the public an entirely different attitude of mind toward them. The railways are seeking an increase of fares in order that they may continue to render service to the public. But a great part of the public seems to think only that the companies seek the increase of fares to pay higher dividends. The truth is that the prosperity of the utility and the prosperity of the city are prosperity in common and it is for the benefit of both. Elemental as this is, many do not yet understand it. It will take intelligent and persistent publicity for this idea to give it the general acceptance to which it is entitled.

Several up-State newspapers, notably the Syracuse *Post-Standard*, while frankly skeptical at first of the proposition to increase car fares, has, since the publication in advertisements by the New York State Railways of a complete showing of the financial facts, said practically this: "The company has proved its case; it needs more money." The *Post-Standard* adds: "Because the system cannot grow in equipment and service as it should on a 5.30 per cent return it does not follow that it must have an 8.32 per cent return (indicated from a 6-cent fare)."

This reveals the mental attitude of one looking upon the increase merely as a benefit to the company. It is not at all a matter of granting anything, little or much, to the railway company for the sake of making the company or its officers more prosperous, or just to be fair, as so many seem to think. It is entirely a matter of putting the company in financial position to bid successfully in the open market for capital in order that it may be able to provide service for the public.

And capital must be bid for in an open market where it has many other opportunities. If the people want the use of this capital in their electric railway service the bid must be whatever the conditions of the money market make necessary. Therefore the question really is what return will induce the capital in the open market to accept your bid. If it's an 8.32 per cent return, then it's 8.32. If it's only 7.32 so much the better. But under certain industrial conditions the return needed to secure the capital may even be 9 per cent or more, and if that's the rate that's the rate, and it must be met or your electric railway company must go without, which means a reduction of service.

Now the electric railway business is one of many hazards and fluctuations of which the layman seldom thinks. A disastrous trolley car collision like that at North Branford, Conn., the other day, or the more recent ones in Pennsylvania and in Virginia, or an accident like that at Niagara Gorge a few weeks ago where many lives were lost, may even bankrupt a company with judgments for damages. The risk from flood, from fires, from business depression or disaster to manufacturing plants and the like, seriously damage the electric railway receipts, and capital takes this into account. Just at present traffic is large because of general industrial activity. But this is not a permanent condition. Courts and public service commissions all over the country have many times declared that a rate of return of 8 per cent on the actual value of the property used in the public service is a fair average return. But if 8 per cent is to be the average, the return in years of activity like the present must be above 8 per cent to offset the years of business depression when the return is, say, 5 or 6 per cent, to say nothing of providing against disasters of the kinds spoken of above.

The point to be made clear is simply this: that under any kind of ownership, either public or private, capital has to be used to provide service, and the cost of getting that capital has to be met. The companies are petitioning for increased fares simply because they cannot without more income, get capital to provide service. The ultimate cost to the riding public is the same whether the exigency be met by increase of fares or a charge for transfers.

It must be remembered that an electric railway line is never finished. It is always building or replacing or extending, and it has to have a constant supply of capital each year just as much as it has to have a supply of coal or oil or wire or cars. Whatever their market price may be the company must meet it or stop running, and it's just the same about procuring a supply of capital.

If the Public Service Commission, convinced that to keep up service the companies need more income, should grant an increase but not increase enough to meet the situation, the public will be no better off than before. If your boy needs a suit of clothes and the cheapest suit that can be had costs $5, it won't help the naked boy to offer the clothing man $2.

The whole question resolves itself into a very simple business proposition: Are the companies getting enough income to keep up a good public service and pay a fair return on the capital actually used in the business? If not, it is the function of the commission to find out what the correct return to the companies is and to take the necessary steps to see that they get it. To do less would cause the public to suffer through the necessary cutting down or loss of service.

Fellow directors of Philip J. Kealy in the Kansas City Athletic Club recently presented him with a silver-mounted saddle and bridle, for his use as colonel of the 3d Regiment, Missouri National Guard. Colonel Kelly is on leave of absence from his duties as president of the Kansas City Railways.

Legislative Relief Is Imperative

President Sullivan Tells Massachusetts Investigating Commission that Railway Burdens Must Be Lightened to Avoid a Crippling of Service

THAT electric railway service in Massachusetts is suffering from malnutrition and that the public may look forward to crippled accommodation, if not a complete breakdown of transportation facilities, unless relief is secured through legislative action, is the prediction made by P. F. Sullivan, president Bay State Street Railway. This statement was made in an address on Sept. 5 before the members of the commission to investigate street railways, appointed by the 1916-17 Legislature.

"After thirty years' experience in electric railway operation," declared President Sullivan, "I warn this commission that unless relief is thus obtained that will result in reduced transportation expenses and coincidently permit fare schedules based on service rendered, the public must look forward either to a discontinuance of service or else to operation by the State."

Five-Cent Fare an Error

The original error made by electric railways, President Sullivan said, was that a uniform fare was established, regardless of local conditions and without taking into consideration the changes of time. The lone and illogical argument in favor of the nickel is that it is a convenient coin. Its use as a measure of transportation cost is contrary to good business and to economic law. Unfortunately, however, there has been a kind of unexpressed belief on the part of the public that economic law does not apply to electric railway service.

Continuing, President Sullivan said:

"Cities and towns expect an unchanging and uniform rate for the electric railway fare, but do not expect and do not have a uniform rate of taxation, or a uniform rate for gas, electricity, water and other necessities the cost of producing which is governed by changing conditions. But who stops to think that the electricity necessary to operate miles and miles of transportation lines increases in cost with the increase in the price of coal just as inexorably as does the cost of the electricity used in a parlor lamp? Yet this item is but one of many things which have increased the cost of electric railway service. The Boston-Nahant steamers were discontinued this summer because the price of coal, with no increase of fare permissible, made the operation of the line impossible without loss. Had the steamers plied, transportation would have been provided for less than cost. Electric railways are in this very predicament. In many localities transportation is being furnished for less than cost. This cannot last. An electric railway is no more a charitable institution than is a restaurant or a grocery store."

Order for New Cars Held Up by Lack of Capital

Mr. Sullivan went on to tell how the Bay State Street Railway recently ordered 200 new cars of the prepayment type, hoping that with this additional equipment the service might be improved. When authority was secured for issuing $2,500,000 of serial coupon notes at 6 per cent, it was found impossible to make the sale. Capital had gone on strike. It became necessary to organize a car trust to take over the car contracts and lease the cars to the company. This plan was approved by the commission, and the company is now placing the new cars into service as rapidly as they are delivered.

Passengers Carried at Fifty Cents Each

The Bay State system, President Sullivan stated, operates in ninety cities and towns. Previous to present high prices, the lines in some cities were operated at a profit, others at a loss. All the lines were under one management, well organized, careful, resourceful; yet the results varied as much as the localities varied. In one locality—the line between Wilmington and Billerica Center, 6½ miles long—the cost of carrying a passenger is 50 cents. It requires the carrying of a great many additional passengers on a profit-making line to offset this loss, and when the various returns from all the points are averaged, the company finds itself furnishing railway transportation as a gift, so to speak.

Cleveland System Is No Guide

Refuting the claim of those who maintain that the Cleveland system can be profitably adopted by other localities, President Sullivan pointed out that there is no comparison between Cleveland and the principal cities on the Bay State lines. From 1890 to 1917 the population of Cleveland increased 186.9 per cent, while the average increase of Springfield, Worcester, Fall River, Brockton, Lynn and Lowell, was 90.2 per cent, and the population of these six Massachusetts cities is less than that of Cleveland alone. Moreover, Cleveland has the advantage of wide streets, making construction and operation much less of a problem than is the case in the crooked and narrow streets of the historic New England municipalities.

Furthermore, notwithstanding that the standard of service is not up to that in many other cities, the people of Cleveland have been so persistently told that they have the "best system in the world" that they believe it, and calmly put up with inconveniences—longer distances between stops, etc.—that would otherwise draw adverse criticism. President Sullivan also said that the present generation is in reality enjoying transportation in Cleveland at less than cost, but that this must be paid for by the next generations, when new equipment, right of way, etc., must be provided.

The Problem Is Serious

In summing up, President Sullivan pointed out that increased rates alone will not solve the problem, as there may come a time when increased rates will not be followed by a corresponding increase in income. Rates should be kept low; but to keep them low, relief must be given from taxes and other operating burdens.

Should this relief not be secured, it may become necessary for the communities to take over and operate the railways in Massachusetts, if the public is to receive adequate service. If the properties should be taken over by public authorities, they could be operated by private companies, *i.e.*, under public ownership and private operation. But this would result in serious complications, and the adjustment between towns and cities, each with its own conditions, would greatly interfere with efficiency.

In reply to questioning Mr. Sullivan told the commission that he favored the relief of the railways from paving charges and taxation. The latter would amount to $600,000 a year. Jitney regulation, he said, was also essential. He also recommended that all labor

disputes be referred automatically to the Public Service Commission, and that in entering electric railway service every employee be required to sign an agreement to this effect. All powers now exercised by boards other than the Public Service Commission should be transferred to the latter. Furthermore, the companies should be reimbursed for their investment in community improvements, such as street widening, paving, bridges and grade-crossing abolition, in amounts which the commission should determine.

Why Not a Commercial Department?

It Is Just as Necessary for an Electric Railway as for a Manufacturer and Largely for the Same Reasons

BY M. B. LAMBERT
Assistant Manager Railway Department, Westinghouse Electric & Manufacturing Company

THE more one thinks about the problems confronting the electric railways to-day, the more he is impressed with the fact that the railways should be organized somewhat similar to the manufacturing industries. The problems before both are of three kinds, namely, commercial, engineering and production.

The manufacturers produce machinery and supplies; the railways produce transportation. The commercial department of the manufacturer sells the product; the commercial department of the railways should sell its product (transportation) to the public. This duty in both cases should embrace every phase of the selling problem, including a study of the necessary price (or reasonable fare) which the company should secure for its product.

With the manufacturing company, the cost of everything which the company as a whole must carry is known and is reduced to percentages to be added to the cost of its product, and if the total reaches an amount that the trade will not bear, the commercial department confers with the engineering department and the production department to determine what reductions in manufacturing cost are possible with a given lump sum development charge. The recommendations of the commercial department are then placed before the management for action.

For many years the commercial departments of the electric railways have not had to concern themselves with the price of their product. It has been fixed by law, and aside from what the legal departments have done to effect a change, the railways have done little or nothing, or at least, have accomplished little. Considering the question from purely a business standpoint, the average man in the commercial department of a manufacturing company would say that the commercial men in the electric railway industry have not been on the job. In fact, it is somewhat difficult to tell, on many properties, who represents the commercial interests of an electric railway. On some it is the president who takes a lively interest in the every-day commercial problems and signs the notices posted in the cars and printed in the newspapers. On others, a publicity man does this. On still others, it is the claim department which cares for complaints, etc. In other words, on the average electric railway the organization is similar to that of a manufacturing company except that the sales department is omitted. Some manufacturing companies at times have tried to get along without regular commercial departments, but all now recognize their necessity.

The writer has made it a habit, during the last few years, in the various towns and cities visited and whenever opportunity offered, to ask different residents whom he has met about the local railway, and has found that the vast majority knew nothing about the conditions under which these roads are trying to make both ends meet. On the contrary, the general impression is that the only interest the railway company has is to cut expenses, run worn-out cars and make all the money it can out of the town.

WHY NOT A RAILWAY COMMERCIAL DEPARTMENT?

The object of mentioning these things is to introduce this question:

Would it not pay each railway to maintain a commercial department to acquaint its patrons with the company's product, to conduct the right sort of publicity and, generally, to keep in touch with the public, much as the commercial department of a manufacturing company keeps in touch with consulting engineers, architects, etc., who have connections or influence in the purchase of the manufacturer's product?

As previously mentioned, it is also the function of the sales department to keep the engineering and production departments constantly alert in the matter of reducing costs to meet competition, increase profits and develop business. The function of the commercial department of a railway would be similar. It would have nothing to do with the daily routine operation of the road, excepting when production (*i.e.*, transportation) did not come up to the guarantees given to the customers. But it would be its function to bring pressure on the engineering and maintenance departments to find ways and means to reduce costs, and when all efforts were exhausted along these lines and an insufficient margin of profit still existed, it would be up to the sales department to get a higher price for its product.

I recently visited a small town where eight or ten cars are operated, the headquarters of the company being about 20 miles away. The superintendent in charge of the property has other duties and visits this particular line probably once a week. For the remainder of the time it is in charge of a local man who operates certain trips himself daily.

The investment represents probably $200,000, which is not far from the average investment in the other large business enterprises in the town. Imagine now whether any other of these enterprises would leave its entire business in the hands of a dozen employees without responsible head. If the Town Council desired any change there is no one locally with the railway of commercial training with whom dealings could be had. I conversed with one or two of the trainmen and, as usual, was told (of course confidentially) that all they heard from those higher up was "cut down expenses," etc. Imagine, again, what chance that property has if it should go before the Town Council and ask for a reduction in taxes.

The point about this story is this: Would it not pay the company to have a good experienced man in that community to take part in its various civic affairs and be the business man in charge of that $200,000 investment? Or, if it could not afford to pay for the

entire time of such a man, ought it not to pick out some prominent local man in some other line of business who could give a share of his time to looking out for the commercial interests of the railway company?

Of course, I realize that the problems confronting the electric railway and those of the manufacturer are not identical. The parallel is not complete in all respects. But the commercial questions on the two are at least analogous and should be susceptible of somewhat the same treatment.

COMMUNICATION

Sleeve or Ball Bearings for Motors?

Sept. 10, 1917.

To the Editors:

I have read with interest the editorial in your issue of July 21 entitled "The Possibilities for Anti-Friction Bearings," in which you say that the industry is at last becoming aroused to the value of anti-friction bearings. At present, I admit, the value is somewhat of a hopeful character; that is, everybody hopes the anti-friction bearing will be a success. But the growing favorable opinion regarding the value of these bearings is largely the result of effective exploitation on the part of the bearing manufacturers and a desire on everybody's part to make anti-friction bearings a success.

Coming right down to cases, what is there in the anti-friction bearing that will justify the extra inherent cost of about $20 per motor, as compared to motors equipped with up-to-date sleeve bearings?

A great deal is said about the saving in cost of inspection due to prolonging the lubricating period from some twenty to thirty days up to six months or a year. As a matter of fact the presence of the sleeve bearing on the axle means that the oiler goes to the motor and performs the oiling operation just as frequently as before, and the only saving that can be charged up to the anti-friction armature bearing is the time involved in opening, filling, gaging and closing, plus the saving in lubricant. This is a very small percentage of the total time and expense of oiling a car equipped with armature and axle bearings of the sleeve type.

Again, increased gear and pinion life is claimed with the anti-friction armature bearing, but we know that 75 per cent of the error in center distance existing with the sleeve type axle and armature bearings must be charged to the axle bearing, and this is left unchanged, so that again only a small proportion of the maximum saving over present standard equipments is actually gained.

It is claimed that the anti-friction bearings will materially reduce the number of armatures now damaged, due to getting down on the pole pieces, but this failure is very infrequent on motors equipped with up-to-date sleeve bearings, and where it does occur it is almost always directly traceable to neglect.

It would also appear that the life of carbons and commutators would be slightly bettered, but here again worn axle bearings are the cause of most of the vibration which results in the deterioration of these parts.

Much is made of the lesser friction in the anti-friction bearing. This is true, however, only of starting friction, as at a comparatively low speed the friction of the so-called anti-friction bearing is actually greater (as proved by exhaustive tests) than the friction of the sleeve-bearing type bearing. There is here, however, a possibility of some service of definite advantage by a reduction of peak load where the frequent starting of a large number of equipments may produce a most serious condition in the particular operation.

The anti-friction bearing, to be an enduring feature of railway equipment, must show a definite financial saving to assist the railways in finding a way out of their present financial condition. There are no reliable data at hand from which general conclusions can be drawn regarding the comparative cost, including renewals, over a long period for anti-friction and sleeve-type bearings.

The editorial says that before bearing makers can go much farther with regard to present motors, they must secure more material and moral support, and continues: "It is up to the railways themselves to break away from traditional styles of motor armature bearings." This, of course, is true only if there is definite gain in the new types over those proven by long service.

It is my impression that before ball bearing makers can logically expect more material and moral support, they must assume responsibility for the brunt of possible expenditures by protective guarantees better than any they have ever yet been willing to offer. At present their best guarantees cover design, material and workmanship of their product for one year. Experience proves, however, that one year of successful service fails to demonstrate conclusively the fitness or money-saving capability of an anti-friction bearing. A strict adherence to this limited guarantee on the part of anti-friction bearing makers places the burden of responsibility either upon the customer or upon the motor manufacturer. It is evidently illogical for the motor manufacturer to bear the brunt of this development when the superiority of the innovation over his standard apparatus is still in doubt. It is also illogical for the customer to be expected to go in on a large scale on a new development when the ultimate profit, if successful, will revert to the manufacturer of the new article. Therefore, instead of its being up to the railways to break away, I claim that it is up to the anti-fraction bearing maker to give a guarantee that will protect the ultimate customer up to the point where the success of the anti-friction bearing is beyond all question.

It may be questioned whether it is right or wrong for the electric railway trade to expect the complete protection referred to above. The practice, however, has gained considerable headway, and the operators look to the manufacturers of equipments to make good anything that can be suspected of being defective, regardless of the length of time it has operated. If the advent of ball bearings into the electric railway field would be an entering wedge to break up this practice, it would be worth all it costs. You will see the justice of this argument if you will consider for a moment that the electric railways pay what it costs to manufacture, sell and keep sold electrical equipments. Therefore, any over-liberal policy in caring for apparatus simply distributes over all electric railways the cost

of troubles that may be local, whereas a strict adherence to contract terms makes each railway stand squarely on its own feet.

It looks as if anti-friction bearings would have to be made a success, because both equipment manufacturers and railway operators have committed themselves to this development. I expected to see the development more gradual so that errors could be corrected and the new development inaugurated without intolerable expense. At present the movement is going faster than sound business principles would dictate, this being due, as already stated, to an artificial demand created by advertising campaigns on the part of anti-friction bearing makers.

You will be serving the interests of all parties to this development if you bring out clearly, by further discussion in your columns, the fact referred to above that the electric railways will ultimately pay for whatever this development costs.

In conclusion, it seems to me that if the makers of anti-friction bearings cannot afford to make guarantees of duration longer than one year, it is because the risk is too great. If it is too great at this introductory stage of the development, then it is too great to permit the operation of large numbers of motors so equipped, and unless practically all the bearings are successful for periods far in excess of one year it will be impossible to justify the first cost and the cost of renewals.

ENGINEER.

Annual Meeting of Electric Railway Section N. S. C.

Well Attended Sessions Held in New York City in Connection with Sixth Annual Safety Congress

THE keynote of the papers and discussion at the meeting of the electric railway section of the National Safety Council, held in New York City on Sept. 12, 1917, was the necessity for discipline as the basis of successful safety work. The two sessions which comprised the meeting were held in the Hotel Astor and were attended by about fifty electric railway representatives. Edward C. Spring, Lehigh Valley Transit Company, Allentown, Pa., chairman of the section, presided. Space limitations prevent the publication of a full report of the meeting but abstracts of the principal papers will be given in a later issue. On account of the necessary absence of several of the scheduled speakers there were some deviations from the program printed in last week's issue of this paper.

COMMITTEE REPORTS

For the committee on membership G. O. Smith, H. L. Doherty & Company, stated that the net membership is now 139 electric railway companies. Starting with fifteen members less than three years ago the growth has been rapid, with a gain of forty-nine the first full year and seventy-five the second year. The prospects are excellent for securing a membership of 200 before the next meeting.

Mr. Smith also reported for the committee on safety education, of which H. W. Clapp, Columbus Railway, Power & Light Company, Columbus, Ohio, was chairman. He said that a large number of special bulletins have been sent out during the year just closed. In commenting upon this report Chairman Spring advised greater economy in the distribution of printed matter, by sending it only to those members likely to be interested.

PAPERS AND DISCUSSION

In place of the paper which was to have been presented by H. W. Clapp on "What Does the Safety Worker Want the President of His Company to Know?" Chairman Spring opened a general discussion of this subject. He said that it is the duty of the president to insure co-operation among heads of departments in this matter of safety. This the president cannot do unless he is personally interested. C. B. Scott, manager Bureau of Safety, Chicago, Ill., said that the basis of accident reduction is discipline which depends on the executive of the property.

Mr. Scott next digested a report on the extent and causes of collisions between electric railway cars and automobiles. This was based on data furnished by nearly fifty roads and covering about 19,000 accidents. The work was begun by Capt. H. A. Bullock, now "somewhere in France," who carried it on until he went into service. Mr. Scott had arranged the data in tabular form, but explained that the report must be considered only as one of progress.

The first formal paper read was by H. V. Drown, general claim agent Public Service Railway, Newark, N. J., who spoke on "Co-operation Between the Claim and Transportation Departments." H. A. Nicholl, general manager Union Traction Company of Indiana, Anderson, Ind., followed with a paper on "Some Methods of Securing and Sustaining the Co-operation of the Trainmen in Accident Prevention Work." Both papers were extensively discussed. Abstracts of these papers and of Mr. Scott's report, with the discussion, will appear in a later issue of the JOURNAL.

RESULTS OF ELECTION

The day's work of the electric railway section closed with a brief business session. The nominating committee, comprising V. J. Waltz, Toledo Railways & Light Company, Toledo, Ohio; C. L. Turner, H. L. Doherty & Company, New York, and H. B. Adams, Aurora, Elgin & Chicago Railroad, Aurora, Ill., presented the names of the following who were unanimously elected:

Chairman, Julien H. Harvey, Kansas City (Mo.) Railways.

Secretary, J. C. Davidson, Denver (Col.) Tramway.

Chairman membership committee, R. S. Metzger, Toledo Railways & Light Company.

Chairman committee on safe practices, J. H. Pratt, United Railways & Electric Company, Baltimore, Md.

Chairman committee on safety education, H. W. Clapp, Columbus Railway Light & Power Company, Columbus, Ohio.

Chairman committee on program, A. J. Van Brunt, Public Service Railway, Newark, N. J.

A resolution of best wishes to Capt. H. A. Bullock, former chairman of the section, was passed with expressions of regret that he could not be present. Another resolution authorized the chair to appoint a committee of three to confer with representatives of the national steam and electric railway, and automobile associations with respect to standards for grade crossing protection. G. O. Smith was appointed chairman with authority to select his associates.

EQUIPMENT and MAINTENANCE

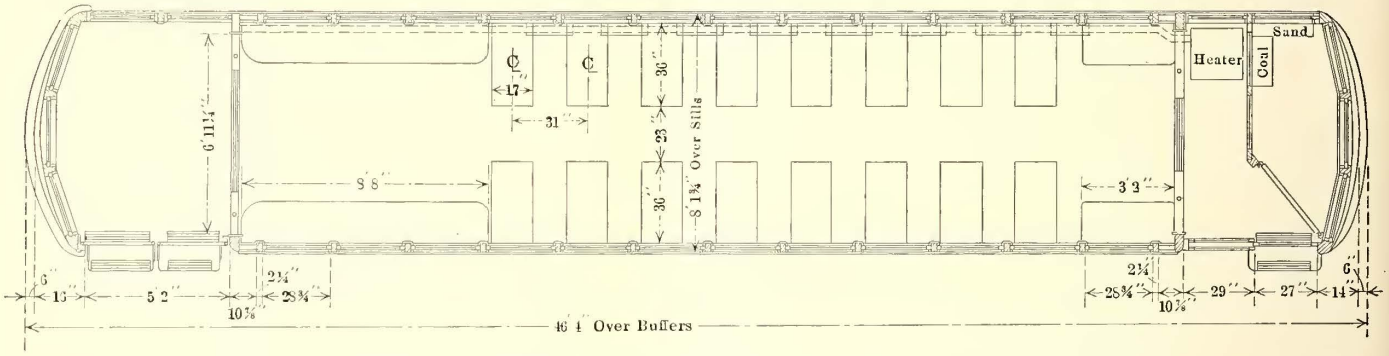
HAVE YOU A GOOD WAY OF DOING A JOB?
—Pass It Along

These Articles Have Been Selected to Provoke Thought and Stimulate Discussion. All of the Technical Departments Are Represented

The New Standard Hodenpyl-Hardy Car

Design with 33-Ft. Bodies, Closed Vestibules, Open Bulkheads, Arch Roof, Semi-Steel Construction, Weighing 38,000 Lb. Complete with Four-Motor Equipment

Hodenpyl-Hardy & Company, Inc., have practically selected as standard a 33-ft. car body as best suited to the conditions of their larger city properties. Fifteen cars of this type have been delivered to the Grand Rapids, Mich., and ten to the Akron, Ohio, railways. In general, these cars are designated as the 33-ft. type, the bodies being 33 ft. long over the corner posts and 46 ft. 4 in. long over all. The construction is the com-



FLOOR PLAN OF NEW HODENPYL-HARDY CAR WHICH HAS A SEATING CAPACITY OF FORTY-EIGHT

posite type, with steel underframe and steel sides up to the window rail, and with a wooden superstructure and arch roof. On account of the hilly conditions in both Grand Rapids and Akron the cars were equipped with four motors. These are GE-204 type. The trucks have a 4-ft. 6-in. wheelbase and 33-in. wheels, and are Standard O-50 type.

The interior layout is shown in the accompanying drawing. It comprises an open bulkhead construction and an arrangement of cross seats and longitudinal seats which facilitate the ingress and egress of passengers. The bodies are designed for pay-within, single-end operation and equipped with doors for closed vestibule operation. The rear entrance and exit doors are of the folding type, with folding steps, and the front exit is a sliding door with folding step. The rear exit doors fold outward and the entrance doors fold inward, and all are manually operated by the conductor from his position at the rear bulkhead, where the two door-operating levers are carried on a center stanchion. The fare box is located on the stanchion just in front of the conductor as he faces the rear, and the clock register, arranged for foot operation, is placed overhead on the bulkhead inside the car body. The rear platform is generously dimensioned to allow for a rapid loading and get-away, and for fare collection after the car has started. A partition on the front platform provides a cab for the motorman in which all the control equipment is installed, and also the coal box and one sand box for the left-hand rail only. These are narrow wooden boxes lined with galvanized sheet iron. The heater is installed on the platform, just behind this partition. The sliding door at the front end of the car is manually operated by the motorman.

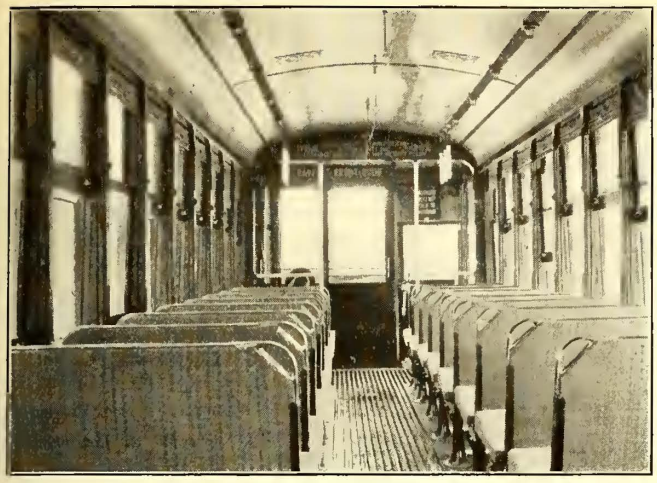
The sixteen cross seats, the two six-passenger longitudinal seats at the rear, and the two two-passenger longitudinal seats at the front give a total seating capacity of forty-eight. This capacity is attained with a car weight as follows:

Body	18,000 lb.
Electrical equipment	6,463 lb.
Trucks	11,400 lb.
Brakes	1,361 lb.
Heater	400 lb.
Total weight	37,624 lb.
Weight per seated passenger	784 lb.

The general dimensions of the cars, in addition to those shown on the accompanying plan drawing, are as follows:

Height bottom of sill to top of roof	8 ft. 5¼ in.
Height floor to underside ceiling	7 ft. 6 in.
Top of rail to bottom of side sill	31 5-16 in.
Side posts, center to center	31 in.
Seat, bottom length	35 in.
Seat, back height	30½ in.
Rail to first step (front and rear)	17 in.
First step to platform (front and rear)	14 in.
Platform to car floor (front and rear)	11 in.

The interior of the car is finished in mahogany, with buff-colored headlining. Eighteen 23-watt plain-bulb lamps without shades are installed over the seats. The



INTERIOR VIEW SHOWING FRONT END OF CAR

wood-sash windows are arranged to raise, and the window guards on the outside are divided up in two window sections. All the vestibule sash are arranged to drop into the dash, except the right front window, which is stationary on account of the destination signs. The upper sashes on all windows are stationary.

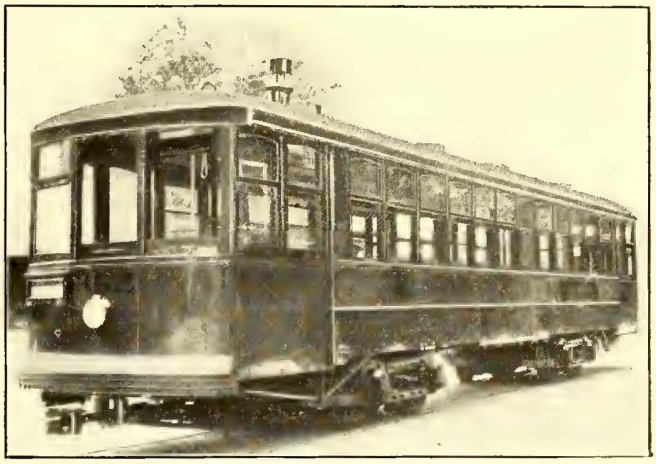
The superstructure is almost entirely of wood construction. The side posts are made of 2¼-in. x 4-in. lumber, and the corner posts are 4 in. x 7 in. The bulkheads are 5 in. thick and of composite construction. The ⅞-in. x 1¾-in. white-ash carlines are bent in one piece and reinforced by nine ½-in. x 1½-in. steel carlines.

The outside of the vestibule is covered with No. 14-gage steel, shaped to cover the bumper. The inside vestibule panels are also made of No. 14-gage sheet steel which is finished to match the interior woodwork. The motorman's glazed partition extending part way across the front platform is 4 ft. 9 in. wide. This is equipped with a suitable curtain on the inside and a bronze window guard on the side toward the car body. An electric marker is placed on each side of the rear vestibule above the windows and set into the end framing so as to be nearly flush.

The main side members of the steel underframe are made of 5-in. x 4-in. x ⅜-in. angle irons riveted to the bottom edge of a ⅛-in. x 36-in. patent level steel plate which is continuous from corner post to corner post. A ⅜-in. x 3-in. flat iron is riveted along the top edge of the side plate. The center sill is made up with an 8-in. 11¼-lb. channel laid flat with the flanges extending downward. The 10-in. 15-lb. channels which form the end sills are placed with the flanges extending outward and are securely riveted to the built-up side sills by means of special steel castings and ½-in. steel rivets.

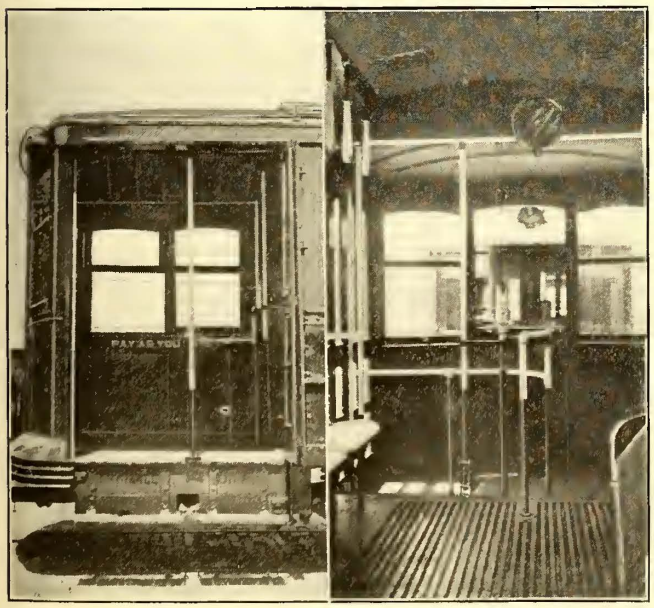
The principal members of the built-up type bolsters are 1-in. x 8-in. steel plates. A 4-in. 5¼-lb. channel is placed on each side of the bolsters which are placed at 20 ft. 6-in. centers. In addition to these cross-members, there are also six 4-in. channels across the body between bolsters. These channels are all laid flat and are riveted to the center and side plates by means of gusset plates.

The platform knees are of the open-truss type construction with I-beam spreaders riveted between the 4-in. 5¼-lb. channels. The center platform knees are made up of 3½-in. x 6-in. x ⅜-in. angle irons which extend from the bumper back to the end sills.



NEW CARS FOR GRAND RAPIDS AND AKRON

The car bodies were built by the St. Louis Car Company, and a list of the miscellaneous equipment on the cars was published in the rolling stock column of the ELECTRIC RAILWAY JOURNAL for June 16, 1917, page 1123.



REAR END OF CAR SHOWING DOORS AND STEPS OPEN, AND REAR PLATFORM STANCHION AND RAIL ARRANGEMENT

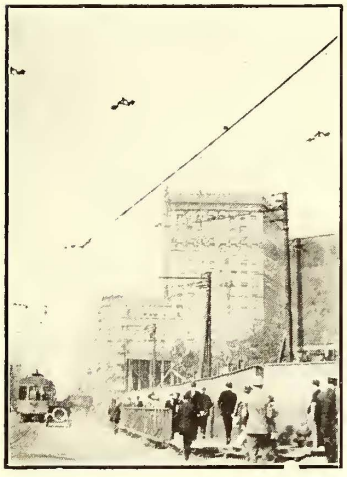
Concrete Slab Below Track No Advantage in Gravel and Sand Soil

T. C. Roderick, chief engineer Grand Rapids (Mich.) Railway, recently took up a piece of track 100 ft. long which had been installed twenty years before as a test installation to prove the value of a concrete slab below the track. In this case a 6-in. slab of concrete was poured, and on top of this 2 in. of light gravel placed for tamping. The ties used were of oak 6 in. x 8 in. x 7 ft. in size, and the space between them was filled with concrete. This track was installed in 1897 with 7-in., 77½-lb. Wharton tram girder rails. When it was taken up the ties were found to be in a condition which would warrant their use for some time yet, but this condition was no better than that of ties in use for the same period in adjacent track constructed without the concrete slab. No advantage could therefore be ascertained

for this type of construction where the soil conditions provided a gravel and sand base, as was the case here. Mr. Roderick thought that if the soil had been clay the concrete slab construction might have shown a prolonged life for the ties and general track condition.

Displaced Feeder Cable Carried Temporarily on Span Wires

When it becomes necessary to get heavy feeder cables out of the way to permit building operations, this may be done safely by simply shoving the cable out on the span wires and tying it there in some temporary manner, according to James Scott, superintendent of overhead Cleveland Railway. The accompanying halftone shows an instance in Cleveland where a 1,000,000-circ. mil cable was taken care of in this manner. It was not necessary to remove the poles, but the cable location had to be changed to allow the work on a new building to progress without interference. The span wires are ½-in. standard steel cables, 100 ft. long and spaced about 100 ft. apart. The extra load placed upon them by the heavy feeder cable is not sufficient to particularly jeopardize the safety of the overhead construction.



HEAVY FEEDER CABLE CARRIED ON SPAN WIRES TEMPORARILY

Mazda Car Lamps as Voltage Regulators for Incandescent Headlights

The Author Shows Why They Are Well Adapted for Use as Headlight Resistors

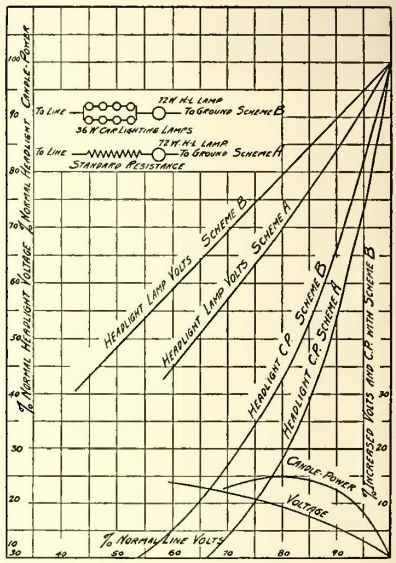
BY J. R. McFARLIN
Electrical Engineer Electric Service Supplies Company, Philadelphia, Pa.

Incandescent headlights, whether employed for city, suburban or interurban service, possess among other advantages those of low first cost, very low operating and maintenance costs, and desirable operating conditions. One disadvantage is that under moderate line voltage drops the projected candlepower is somewhat more reduced than in the arc headlight. Where voltage drops are severe, however, the incandescent headlight will afford some light even under the worst conditions.

Many attempts have been made to design a voltage regulator for incandescent headlights, but of these none has up to the present time come into general use. Aside from voltage regulators there are two general schemes for supplying power to the headlight from the trolley, as follows: (1) It may be connected directly in circuit between the trolley wire and ground in series with resistance to allow proper voltage across, and current through the headlight bulb. (2) It may be connected in series with the Mazda lamps used for car illumination.

The headlight resistors used under the first plan have approximately a zero temperature coefficient, hence do not act in any way as regulators of the headlight bulb voltage. As the headlight bulb itself has a positive temperature coefficient it tends to prevent the voltage impressed upon it from decreasing directly in proportion to the line voltage and so acts in a manner as a voltage regulator. For purposes of comparison with the second scheme the first will be considered as comprising a totally unregulated circuit.

Where the headlight is operated in series with the car lamps, the most common combinations are as follows: (1) 36-watt headlight bulb in series with four 36-watt series car-lighting bulbs; (2) 46-watt headlight bulb in series with four 46-watt series car-lighting bulbs; (3) 46-watt headlight bulb in series with two parallel circuits of four 23-watt series car-lighting bulbs; (4) 72-watt headlight bulb in series with four 72-watt series car-lighting bulbs; (5) 72-watt headlight bulb in series with two parallel circuits of four 36-watt series car-lighting bulbs; (6) 94-watt headlight bulb in series with four 94-watt series car-lighting bulbs, and (7) 94-watt headlight bulb in series with two parallel circuits of four 46-watt series car-lighting bulbs.



VOLTAGE AND CANDLE-POWER CURVES FOR INCANDESCENT HEADLIGHT

Since the temperature coefficient of resistance of a tungsten filament lamp is highly positive, the headlight bulb connected according to the second plan will have a certain inherent regulation as compared with one connected in series with a resistor having a zero temperature coefficient. Below are given data obtained from a typical test made to show these qualities.

Results of Test

For the test a 72-watt, 115-volt Mazda "B" filament in a G-25 headlight bulb was burned in series with two parallel circuits, each consisting of a series of four 36-watt, 115-volt, Mazda "B" lamps. The results are shown herewith in tabular and graphical form. In the table the several columns show the following quantities, all values being given in per cent and 100 per cent representing normal operating conditions.

E_h = voltage across headlight bulb.

I = current through headlight bulb.

CP_h = candlepower of headlight.

E_{lc} = impressed line voltage when headlight is burned in series with Mazda car lamps.

E_{lr} = impressed line voltage when headlight is burned in series with standard headlight resistance.

Readings were taken first with E_h at 115 volts and

TABULATED COMPARISON OF RESULTS OF HEADLIGHT TESTS
Per Cent Values

E_h	I	CP_h	E_{lc}	E_{lr}
100.00	100.00	100.00	100.00	100.00
95.65	97.53	85.50	96.13	97.47
91.31	94.92	72.50	91.96	94.79
86.96	92.32	61.00	88.23	91.81
82.61	89.59	49.00	83.46	88.83
78.26	86.98	42.00	78.84	85.85
73.92	83.99	34.00	74.82	82.86
69.57	80.99	27.50	70.64	79.58
65.22	77.74	22.40	66.02	76.31
60.87	74.61	17.60	62.00	72.88
56.53	71.62	13.30	57.83	69.60
52.18	68.36	10.00	53.36	66.02
47.83	64.98	8.00	49.04	62.45
43.48	61.33	5.10	45.16	58.87

with successive drops of 5 volts to a minimum of 50, all other quantities being read simultaneously. The candlepower values were taken from curves which showed the relation of voltage and candlepower, and current and candlepower for the type of lamps used.

While the curves reproduced show relations under only one set of typical conditions it has been found from other tests that the data are sufficiently close to apply to any of those listed, as for instance, a 94-watt headlight bulb operating in series with two parallel circuits each consisting of a series of four 46-watt bulbs.

It will be noted that as the line voltage drops the headlight voltage throughout the range observed is considerably higher with the second plan than with the first. Likewise the candlepower of the headlight is considerably higher throughout the range. In the lower right-hand corner of the curve sheet the increased headlight voltage and increased headlight candlepower are shown graphically, indicating, for example, a 15 per cent greater candlepower at 80 per cent of normal line voltage with scheme (2) than with scheme (1). These curves were obtained from the four main curves by simply plotting the appropriate ordinate values.

The curves also show how much greater the line drop may be with one scheme than the other for the same headlight candlepower. For example, if when the headlight is operated in series with a standard resistance the line voltage drops to 76.3 per cent of normal, it might drop to 66 per cent, or 10.3 per cent more if it were connected in series with the car lamps, the candlepower being the same in the two cases.

PRACTICAL DETAILS OF THE SERIES SYSTEM

Besides its characteristics of voltage regulation, this method of burning headlights in series with the car lights has many other advantages, chief of which might be mentioned its high economy, as no power whatever is dissipated by series resistance, all being utilized either in illuminating the car interior or in the headlight. Then, too, apparatus has been devised and at present is on the market which makes this system so flexible in operation that no operating difficulties need be expected from it. There has been developed, for example, what is known to the trade as a "compensating lighting fixture." This is essentially a lamp socket and shade for the interior car lamps, the socket being equipped with a resistor having resistance equivalent to the bulb used, and an automatic relay to cut the resistor into circuit in case the bulb should burn out. Hence with the interior car lamps so equipped, a burnout of one or more does not in the least affect the normal operation of the headlight or the remaining car lamps in the series.

Again, the headlight bulb may burn out, or it may be desired temporarily to remove the headlight from a particular car, or the headlight may be carried from one end to the other. In either event means should be provided so that the interior car lamps would be unaffected in operation. This likewise has been met and satisfactorily solved by means of compensating or substitutional resistors.

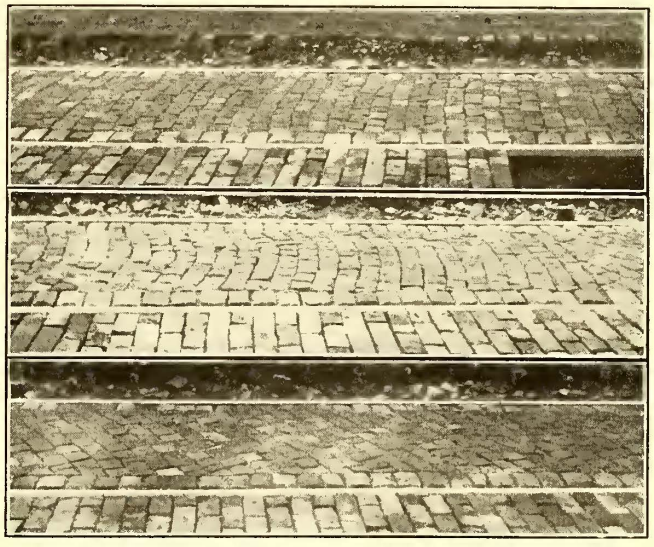
The scheme of burning headlights in series with interior car lights is in use by a large number of representative operating companies in various parts of the country all of whom report entire success with it. A typical application of the plan was discussed in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 27, 1917, page 171.

Experiment with Cube-Shaped Paving Blocks

BY D. P. FALCONER
Engineer Maintenance of Way, New York State Railways, Rochester, N. Y.

The maintenance of way department of the New York State Railways, Rochester Lines, has experimented with cube-shaped paving blocks laid in three different designs, which are shown in the accompanying illustrations.

For much of its paving this company uses Medina sandstone block, which is quarried in the vicinity. In order to use up a quantity of old blocks which were too small for regular pavement, these were recut into 3½-in. cubes. They were laid in rows at right angles to the track, in curved rows and in diagonal rows in order to determine if one method of laying was better than another. The track was of T-rail construction at the location where these blocks were used.



CUBE-SHAPED SANDSTONE BLOCKS LAID IN THREE DESIGNS

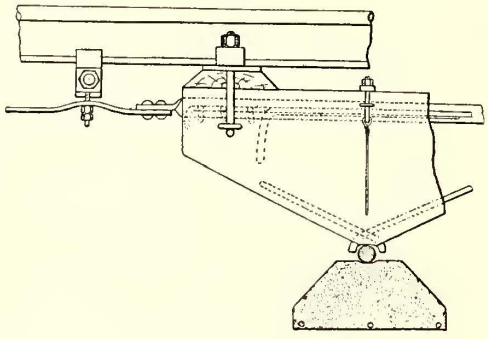
This paving has been in place for three years, it is still in excellent condition, and it was found that each of the three designs worked equally well. It is, therefore, not practical to use either the curved or the diagonal design as it costs more to lay them due to the interference of the tie rods with the blocks.

It was found that it was not an economical proposi-

tion to cut the old paving blocks into cubes unless a machine was used owing to the high cost of hand labor for this work. However, instances are common in which a company is not able to get bricks or standard blocks when wanted, and in these cases the using of the cubes cut from worn paving blocks is one solution of the problem.

Longitudinal Rocking Ties Developed in Italy

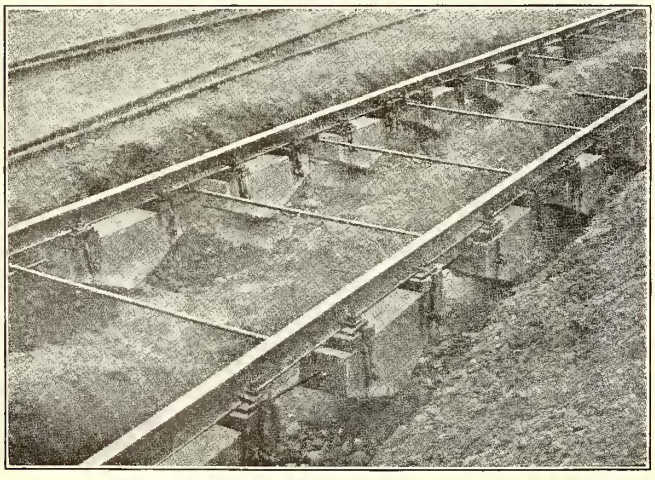
Track construction using longitudinal ties of reinforced concrete installed so that they are capable of a rocking movement is being tried out in Italy on street railway and railroad lines. The details of construction are shown in the two illustrations. Interposed between



DETAIL OF LONGITUDINAL REINFORCED-CONCRETE ROCKING TIE

the ties and the rails are blocks of hard wood which act as cushions and form the real support of the rail. These blocks are spaced about the same distance apart as the crossties which are generally used for track construction in this country.

The objects which were sought in developing this tie were to obtain a uniform elasticity, a more perfect alignment of track, a more exact maintenance of track gage, a resistance to canting at least equal to that pos-



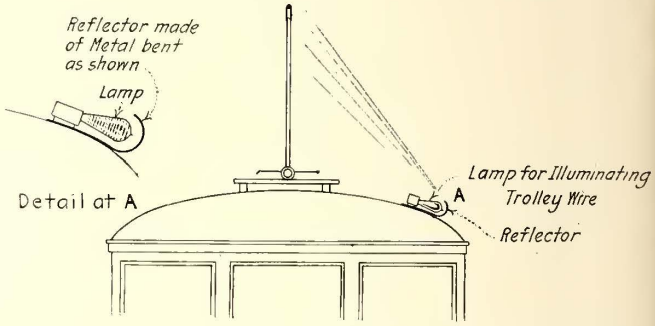
LONGITUDINAL ROCKING TIES BEFORE THE TRACK IS BALLASTED

sessed by lines having the usual construction, and less creeping of the rails. The system was introduced by Signor Olindo Valeri of Asti, Italy, and a description which includes the illustrations used herewith appears in a recent issue of the London *Engineer*.

Replacing Trolley Wheels by Aid of Roof Lamp

BY CHARLES A. SIBERTS
Chief Electrician Grand Rapids, Grand Haven & Muskegon Interurban Railway, Muskegon, Mich.

On the Grand Rapids, Grand Haven & Muskegon Interurban Railway, Muskegon, Mich., there are many points at which a change is made from third-rail to trolley wire construction. This of course necessitates placing the trolley wheel on the wire, which after dark is a hard job. We have, therefore, installed a lamp or the roof of each car as shown in the illustration. The roof lamp is connected with a three-way switch so that it can be substituted for the rear platform lamp which is in series with four other lamps. With this arrangement



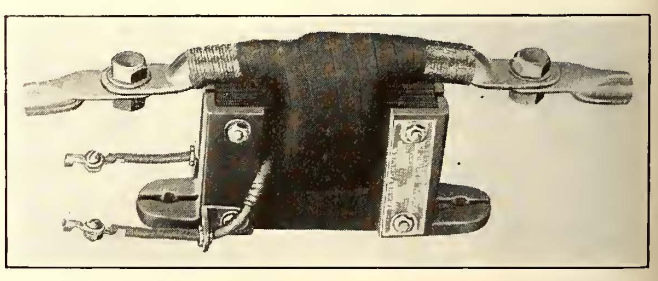
ROOF LAMP TO FACILITATE FINDING THE TROLLEY WIRE

the glare of the platform lamp is eliminated when the conductor is trying to replace the trolley wheel. As the trolley wire and the third-rail overlap a short distance the car lights are supplied with current from the third-rail while the trolley wheel is being replaced.

Since this roof lamp has been found so useful it would no doubt be a feasible plan to operate such a lamp from a storage battery on lines where the roadway is dark and the replacing of the trolley wheels is a troublesome task for the conductor.

Current Transformers for Tripping Oil Circuit Breakers

For the purpose of operating the tripping coil of oil circuit breakers the General Electric Company has developed special current transformers which are used directly or in connection with relays. In addition to the



TRIPPING COIL TRANSFORMERS

trip coil an ammeter may also be connected to the transformer when the trip coil does not require more than 70 volt-amp. at 5 amp.

The illustration shows one of these transformers of the type having the capacity of 5 to 300 amp. This is

equipped with a cast metal base for mounting on a flat surface, or on a pipe support. The higher capacity transformers for use on circuits carrying 300 to 800 amp. are constructed to be mounted on bus bars directly, the primary terminals being simply bare copper bars containing a hole for the bolt.

These tripping transformers are small and can be applied conveniently to many classes of installations in place of the usual series tripping coils used with oil circuit breakers.

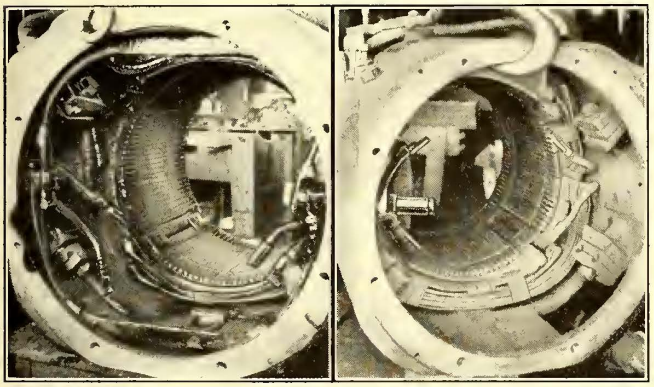
Location of Brushholder Rings Changed to Avoid Grounds

BY MAX PASSLER

Armature Foreman Spokane & Inland Empire Railroad, Spokane, Wash.

Some time ago our company experienced a great deal of trouble with the grounding of the brushholder rings on 600-volt, a.c., single-phase motors which were of the Westinghouse No. 132 and 133 types. In severe winter weather it was no uncommon thing to have four or five locomotives come into the shops in one day with this trouble.

The first of the accompanying illustrations shows the original location of the brushholder rings. The grounding of these rings was due to the large accumulation



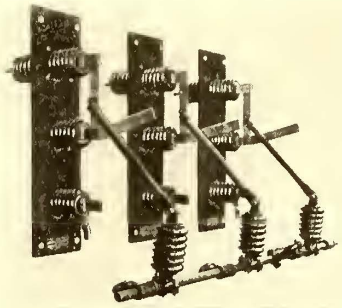
MOTOR FRAME SHOWING ORIGINAL LOCATION OF BRUSH HOLDER RINGS AND MOTOR FRAME IMPROVED BY REARRANGEMENT OF BRUSH HOLDER RINGS

of carbon and copper dust from the commutator, and it was found that this could be avoided by placing the brushholder rings close against the field poles. To do this the cable is led in at the same point, but at the back of the nearest brushholder it passes over next to the field magnets, where it can pass around to the other brushholders without getting covered with dust from the commutator. The new arrangement is shown in the second illustration. This has done away with the grounding troubles, and it can be seen that a large space is left on the commutator end for inspection and cleaning, while in the original design this space was crowded with the brushholder rings and leads. The cost of the change has not amounted to more than $10 per motor.

The Interborough Rapid Transit Company, New York, N. Y., in filling vacancies made by employees who have entered military service, either by the draft or enlistments, will give preference to dependent members of the families of such employees.

Disconnecting Switches Having Manual Remote Control

It is often necessary to install high-tension disconnecting switches in locations where it would be difficult and dangerous to operate them by means of a switch stick. For such installations switches of the remote-control type, permitting all phases to be simultaneously opened and closed by means of a single operating lever

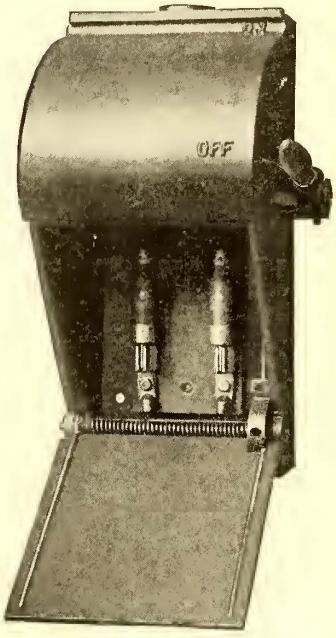


MANUALLY OPERATED REMOTE CONTROL DISCONNECTING SWITCHES

can be used. A recent development of this type of switch, made by the Delta Star Electric Company, Chicago, Ill., is shown in the illustration. In this provision has been made for locking the switch blades in the open position.

New Design of Safety Switch

For some time electric railway men have recognized that exposed knife-blade switches are a continual source of accidents to careless and unskilled employees. The procedure followed in making the so-called "safety" switches is to inclose the switch in a compartment which only authorized persons are to open, and to operate the switch contacts by a handle projecting outside the compartment. When there are fuses in connection with the switch it is esential to interlock the cover of the fuse compartment with the switch handle so that the cover cannot be opened except when the switch is in the off position.



SAFETY SWITCH OF NEW DESIGN

These ideas have been embodied by the Westinghouse Electric & Manufacturing Company in the switch shown in the illustration. The upper compartment contains the knife-blade switch and can be opened only by removing two machine screws. This compartment need never be opened except when making connections or repairs, or for inspection purposes. The lower compartment houses the fuses and the cover is interlocked with the switch lever. Provision is made for locking the operating handle in the off position when this is desired.

News of Electric Railways

Traffic and Transportation

Financial and Corporate | Personal Mention | Construction News

Kansas City Railways Problems

Vice-President Taylor Reviews Rehabilitation Work Already Completed—Makes Plea for Co-operation —Power Problem Being Solved

Following the strike of employees of the Kansas City (Mo.) Railways and the return of the men to work, it was necessary to maintain a service below the former level. The reduction in cars was due chiefly to the desire to allow sufficient current for at least partial operation of some large industries which had voluntarily made large sacrifices that the general public using electricity need not be disturbed.

Conference to Consider Power Supply

On Aug. 28 the acting Mayor, Albert I. Beach, at the suggestion of Clyde Taylor, vice-president of the Kansas City Railways, called a special meeting of officials of the two Kansas Cities. Included in the call were the members of the business men's committee that had helped to settle the strike, and the committee of plant managers which had worked out a schedule by which the peak load had been materially reduced.

At the meeting Mr. Taylor declared that the problems of the company were vital to the community and the community ought to help solve them. He referred to the increasing costs of the street railway and of other industries, and called attention to the fact that the street railway was giving more, rather than less, even under greater costs, than before.

R. L. Redpath, chairman of the business men's committee that had worked out a solution of temporary current shortage, declared that it had been a question of suspending operations wholly in many large industrial plants, or eliminating a few cars during the morning and evening. The prospect of the suspension of industry was touched on by several speakers as being far more serious than the temporary inconvenience of a car shortage. Statistics were presented by the street railway and the Kansas City Light & Power Company indicating that by Oct. 1 there would be an appreciable gain in capacity, and by Nov. 1 probably a complete restoration of service both of cars and of current to power users. The meeting delegated the industrial users' committee to confer with the board of control of the street railway as to the proportion of current, as equipment is put into service, that should be awarded for cars and for power users.

Critical Situation for the Company

The situation is indicated in the narrow margin to which the peak load morning and evening was figured. The large power users are taking only 1280 kw. during morning and evening. Nearly all have reduced their uses of current in these hours by 80 per cent, some by 95 per cent; many have put on night shifts for 50 per cent of their work, and all are reducing their day loads 20 per cent. In consideration of this large sacrifice, the railway reduced its cars, the number short on Aug. 27 being sixty-five, to save 2600 kw. on the peak load.

The railway is now producing 39,000 kw. The capacity of its plants, which it is expected will be fully restored by winter, is 50,000 kw. The light company is increasing its equipment, and by winter will be able to care for practically all its load except on peaks.

Mr. Taylor said that the system served two great municipalities where one for 5 cents may ride anywhere within their limits with a universal transfer. It is possible for passengers to ride 17 miles for 5 cents and many do so. The equivalent charge upon a steam railroad would be 43 cents.

Resumption of Service Ordered

Dunkirk Street Railway Held Not to Have Proved Lines Unprofitable Which It Was Seeking to Abandon

The Public Service Commission for the Second District of New York recently denied the application of the Dunkirk Street Railway, which is controlled by the Buffalo & Lake Erie Traction Company, for approval of its declaration to abandon certain portions of its belt line in Dunkirk and directed the company within five days after the service of the order to resume operation of its cars pursuant to the terms of its franchise. According to the opinion of the board, the Common Council had no authority to act in granting the company permission to remove its tracks or abandon any part of its franchise. This nullifies the negotiations which were in progress between officials of the railway and city officials and councilmen over a period of a year, together with the proceedings of the Council more recently in granting the company permission to abandon parts of its tracks in the belt line. It also serves to make inoperative the agreements made by the company about improvements. By the provision of the order the right is reserved to the company to offer further or different proof as to the necessity of the abandonment.

Opinion by Commissioner Barhite

The opinion in the case was written by Commissioner Barhite. He said in conclusion:

"The excuse for this application by the company is that the lines in the city of Dunkirk are operated at a great loss. By the evidence it appears that two different statements were issued from the office of the receiver within a comparatively short time. One showed a deficit of about $15,000 in the operation of the road for one year and the other a deficit of more than $21,000. At the hearing a statement was introduced which shows that the actual deficit for the year ended March 1, 1917, was $21,921. But this figure was based upon an assumed operating expense of 21.98 cents per car mile. I say assumed because the operating expense is based not alone upon the actual cost in the city of Dunkirk, but also rests upon the cost of operating from 90 to 100 miles of interurban road. No separate books have been kept for the city of Dunkirk. The cost of operation upon the interurban is a different matter from the cost of operation upon the city road.

"Before abandonment is sustained by this commission the people of Dunkirk are entitled to know whether the alleged deficit unavoidably arises from the operation of the road within the borders of the municipality or whether its connection with the Buffalo & Lake Erie Traction Company is responsible for its downfall.

"The Dunkirk Street Railway is a separate corporation and is intended to serve the public within the city of Dunkirk alone. Its future must be determined upon its own merits and not upon its connection with any other enterprise. The operation of the road has been illegally abandoned. Service must be resumed, at least until the petitioner makes out a proper case for the discontinuance of that service."

Service Resumed

The company has resumed service in accordance with the order, but it is regarded as likely that the case will be reopened by the company in an endeavor to establish that the line is being run at a loss. The members of the Merchants' Exchange and other citizens of Dunkirk opposed the abandonment of service as it was agreed to by the company and the Council.

First Philadelphia Hearing

Open Meeting Held Before Committee of Councils—Next Hearing Sept. 21

The first public discussion of the lease of the municipal high-speed lines to the Philadelphia (Pa.) Rapid Transit Company as proposed by Mayor Smith took place in the City Hall on Sept. 7 before the joint Councilmanic committee on finance and street railways. Joseph P. Gaffney, chairman of the finance committee, presided. He opened the meeting with a brief statement to the effect that the people of Philadelphia are to receive every opportunity to examine, criticise and discuss the lease. He urged and invited suggestions for improvement, and he emphasized that "this committee has no cut-and-dried policy," but wants all the information it can get, so that it may give Philadelphia the best possible kind of a transit agreement with the company. The hearing served as the occasion for a thorough discussion of the point raised by objectors that the lease guaranteed a 6 per cent dividend on the capital stock of the company. This charge was made by the objectors, and it was answered a number of times by Dr. William Draper Lewis, the Mayor's special transit legal adviser, who declared that not only does the document not guarantee the Philadelphia Rapid Transit Company a 6 per cent dividend, but that it guarantees the company no dividend whatever.

Mr. Taylor to Be Answered

The most significant event of the hearing was a dramatic passage between A. Merritt Taylor, former director of city transit of Philadelphia, as the chief figure in opposition, on the one hand, and Chairman Gaffney and Dr. Lewis, on the other. Called upon to state his objections to the lease, Mr. Taylor declared his purpose to rest his case against the lease upon his published attacks upon it and to refuse to answer any questions or to make any further statement until his charges had been fully answered. Doctor Lewis disclaimed on the part of those who framed the lease the slightest intention to do any of the things alleged against the proposed contract, and made a pledge to take the initiative in reframing any of the provisions of the lease which might be found ambiguous or open to the interpretation which Mr. Taylor has put upon them. He suggested that at the next meeting Mr. Taylor submit in writing any questions he might desire to propound, embodying his charges and objections. Doctor Lewis said that he would make full oral answer to every question and supplement these with written answers. Mr. Taylor accepted this proposal, thus opening the way, according to the Philadelphia *Public Ledger*, "to that elucidation of the disputed points without which Councils and the public cannot be expected to reach an intelligent decision on this vastly important question."

Among others who appeared in opposition to the lease was John N. McGarvey, representing the Allied Business Men's Association of West Philadelphia. He read a statement of general objection, citing in particular the complaint that West Philadelphia did not seem to have received consideration proportionate to her importance as a section of the city. He said frankly that his association had based its attitude on the Taylor analysis of the lease and that it would be guided by Mr. Taylor's advice. Upon the request of Mr. Gaffney that Mr. McGarvey state his objections to the lease specifically and in detail, Mr. McGarvey declined to go beyond the general statement he had read.

Reasons for Rejection of Previous Lease Proposal

A long statement on the proposed lease was read by Dr. Lewis. He reviewed the reasons for the rejection of the Taylor lease in 1916. Dr. Lewis said that under the terms of the lease as now proposed the company assumed the entire burden by agreeing to postpone its dividend payments until all interest and sinking fund charges on the company's investment shall have been paid. Moreover, the burden on the taxpayer was relieved by removing the increase in the tax rate inevitable under the Taylor lease, according to Dr. Lewis, the car rider can now be called upon to assume the burden only to the extent authorized by the Public Service Commission.

The committee will hold another hearing on the lease on Sept. 21.

Amalgamated Meets in Providence

Pledges Support to Government—Of 80,000 Members, 3000 Have Enlisted for War Service

The fifteenth biennial convention of the Amalgamated Association of Street & Electric Railway Employees of America was opened in Providence, R. I., on Sept. 10. The first business transacted was the adoption of a resolution pledging to the support of the nation "unto the end" the 80,000 members of the association.

More than 300 delegates from all sections of the United States and Canada are in attendance at the meeting. A theater party and a Rhode Island clambake are the principal events held so far this week. The convention took practically all of the first day to organize and the various committees got to work with the matters placed before them. The headquarters are at the Crown Hotel. The sessions are being held in Infantry Hall. The convention will continue for ten days.

The resolution pledging the association to support the nation declared for woman suffrage. It was in the nature of a letter addressed to Dudley Field Malone, who resigned recently as collector of the Port of New York as a protest against the imprisonment of suffragists in Washington. That part of the resolution pledging the support of the Amalgamated to the government was as follows:

"As an organization we fully appreciate the situation which now confronts our government, and in this war we are standing by it loyally and will support it with our means and our lives unto the end. The evidence of this is in our records, which show that up to date more than 3000 of our members have enlisted and are ready for the battlefields of Europe. At the same time we appreciate that this is a struggle, as you have truly said, to establish a world-wide democracy, and if our nation is to be a leader in this great work we must set the example by having thorough democracy at home, and no nation can boast of being truly a democratic nation unless all persons of either sex within it, no matter how humble they may be, has the right to participate in the affairs of the government."

Strike Voted in Chattanooga

A strike of the trainmen of the Chattanooga Railway & Light Company, Chattanooga, Tenn., has been voted by the men. A statement over the name of E. D. Reed, general superintendent, has been addressed to the men. It is as follows:

"Three times this year the company has been placed in a defensive position by the leaders of the Amalgamated Association, and in every instance it has been sustained in the position it occupied by both outside and inside interests. Your own national leaders have twice upheld the company's position in its controversies. Again we face a situation whereby the association is openly defying the terms of its service contract. It is obvious that neither decency nor discipline will permit these continued disturbances, and the history of the past few months demonstrates again the truth of this company's contention that either the union is a source and a breeding place for continued dissensions or that the men are being badly counseled and woefully misguided.

"We have no interest in either the truth or the falsity of the above, other than to advise you that the company will not again treat in any manner with any organization that has so abused its privileges, and that if you desire to continue as an employee of this company, you will report to the superintendent of transportation and so advise him. We will assure you fair and impartial treatment and as good a wage at all times as the condition of the company will justify in return for loyal and continuous service on your part."

The men went out at 6 p. m. on Sept. 7. Some of them deserted their cars on the streets. Disorder followed almost immediately. On Sept. 11 two troops of cavalry and a machine gun company were sent from Fort Oglethorpe to preserve order. One of those reported to have been injured in the early disorder is S. A. Miller, chief inspector of the company.

Service to Cantonments

What Some Companies Have Done to Meet the Demands for Transportation and for Energy for Lighting and Power

The cantonment which was recently established on the single-track Annapolis division of the Washington, Baltimore & Annapolis Electric Railroad at Admiral, Md., has been officially designated as "Camp Meade." The camp site covers an area of approximately 8000 acres of land, 4000 of which are north of the tracks of the electric railway and 4000 south. The cantonment and drill grounds are located on the north side. The acreage south of the tracks will be used for maneuvering. The Baltimore & Ohio Railroad parallels the camp on the westerly side about 1½ miles distant and the Pennsylvania Railroad parallels the easterly side about 1 mile distant. The cantonment proper consists of approximately 650 buildings, occupying a space about 1 mile wide by 2½ miles long. The Washington, Baltimore & Annapolis Electric Railroad has double-tracked its line from Naval Academy Junction to and through the cantonment. This necessitated the constructing of approximately 5½ miles of track. The Baltimore & Ohio Railroad and the Pennsylvania Railroad have both entered into traffic arrangements to operate over the Washington, Baltimore & Annapolis Electric Railroad to the camp.

The company has recently purchased fifty-four trail cars from the Long Island Railroad and has also placed an order for eight electric locomotives. The railway has constructed a three-phase 33000-volt transmission line from Naval Academy Junction to the camp. This energy is there stepped down to 2200 volts for distribution. While the lighting did not require the installation of additional apparatus in either power or substations, the railroad load did, and the company accordingly increased its Bennings substation equipment by three 800-kva. transformers, Naval Academy Junction substation with one 750-kw. rotary converter and Scott Street substation with two 500-kw. rotary converters, with all necessary transformer and switching apparatus.

Considerable Track Constructed at Des Moines

The Des Moines City Railway and the Interurban Railway, Des Moines, controlled by the same interests, have built 3 miles of sidings on the 12-mile stretch between Des Moines and Camp Dodge. In addition, the companies have put in 4½ miles of permanent yard track and 3½ miles of temporary track for use for construction purposes. They have ordered one additional electric locomotive from the Westinghouse Electric & Manufacturing Company. The companies intend to handle the passenger business in trains, using eight or ten railroad coaches in a train hauled by an electric locomotive. The companies are also operating four steam locomotives on the line to handle the freight business. The Des Moines Electric Company has built a high tension line to the camp and will furnish the necessary light and power. There are three passenger stations in the camp and one terminal station in the city. At all the stations, the trains are run into an inclosure and the fares collected through turnstiles when the passengers are entering. As the passenger rush will come in the evening from 5.30 to 11.30, the companies will not operate any freight over the line at that time. During the period that the camp was under construction the electric railways hauled about seventy-five car loads of freight to the camp daily and transported 2500 workmen in the morning and evening.

Line to Fort Riley in Use Some Time

The Union Light & Power Company, Junction City, Kan., has 6 miles of track connecting Junction City, Kan., with Fort Riley on the west and this line connects about one-third of the west side of the new cantonment now being built. The line at Junction City has always been a small one and the company had only five motor cars, but has recently purchased five used trailers from the St. Louis Equipment Company. These ten cars will absorb all the power now available for railway operation. The company is prepared to supply electric current to the camp and has made a contract for 600 kw. The company has installed a 200-kw. rotary and has run an 8-inch flow line about 1 mile to the Smoky Hill River to give a better supply of water for condensing purposes. It has also built concrete storage for holding 2000 tons of coal under water, has purchased four new motor equipments, is increasing its boiler capacity about 1000 hp. and is making other minor general extensions, calling in all for the expenditure of about $100,000.

Rockford Line Extended to Camp

As stated in the Electric Railway Journal of Sept. 8, page 410, the Rockford & Interurban Railway, Rockford, Ill., is building a 2¾-mile extension to a point on the new cantonment at Rockford. It is estimated by the company that it will take about twenty-five additional cars for service to the camp. These will be secured from other properties controlled by the holding company which operates the Rockford property. The company has just recently received thirteen new cars. They are double-truck city P. A. Y. E. cars. Additional cars may also be remodeled to go into this service. The company at Rockford purchases power from the Rockford Electric Company for lighting and power purposes.

The building and establishing of the United States military cantonment at Chillicothe will mean a considerable increase in business for the Scioto Valley Traction Company, Columbus, Ohio. The company believes that it will be able to handle the increased passenger traffic with its present equipment. The freight traffic, which is showing quite an increase, will probably tax the company's equipment to the limit and with this in mind, it is negotiating for the purchase of six additional freight trail cars, of the standard 40-ft. box car type. In addition to the above, the company has secured a contract from the government to supply current necessary for the operation of pumps for the water supply, the laundry and the refrigerating plant. A new line will be built from the main transmission line to the camp site. All the material for this work has been purchased.

At Montgomery, Ala., the Pickett Springs single-track line of the Montgomery Light & Traction Company passes through the proposed encampment and it will not be necessary to erect any other line to serve the camp. The company contemplated double-tracking the line, but on account of the length of time it would require and the scarcity of materials, it was decided that this was impracticable. Two more sidings have been placed on the line. The company recently purchased and had delivered to it six new steel pay-as-you-enter cars. The company is retying the track and ballasting it, and has ordered some new trolley and feeder wire. It operates the cars with trailers, in bunches of four, with a seven and one-half minute schedule.

Hattiesburg Traction Lights Cantonment

Hattiesburg, Miss., in which the Hattiesburg Traction Company, a subsidiary of the Cities Service Company operates, has been successful in securing one of the cantonments which the government is erecting. The cantonment is situated from 5 to 10 miles outside the city limits. The Hattiesburg Traction Company does not expect to extend its tracks to the camp, as the location of the training ground, 10 miles from the city, does not seem to justify the investment. The company is planning, however, to light the cantonment. This will necessitate the construction of a 22,000-volt transmission line approximately 10 miles in length. The service will consist in power for pumping water and current for lighting the buildings and grounds. The power station has ample capacity to meet the added load and no extensions will be made.

The government is establishing a cantonment at Waco, Tex., in McLennan County, the southwest terminus of the line of the Texas Electric Railway. This camp is known as Camp MacArthur. Approximately 6600 ft. of additional trackage will be built to serve this camp, two of the present city lines in Waco being extended to reach the camp. The company does not expect to purchase any additional equipment to take care of traffic. It will, however, rebuild and put into service several of its old cars, thus giving additional equipment for this service. The Texas Electric Railway purchases power from the Texas Power & Light Company and this latter company will make provision to serve the cantonment.

Women in Railway Work

Several Railway Operators State Their Attitude Toward the Use of Women if the Emergency Arises

A number of electric railway operating officials have made statements recently to the press with respect to the possible use of women by them in places formerly held by men if the war emergency and the changed economic situation which in some places has seriously depleted the ranks of the men should seem to make such a course advisable. Henry C. Page, general manager of the Worcester (Mass.) Consolidated Street Railway, is quoted by the Worcester *Gazette* as follows:

"We have not yet come to the place where it is necessary to use women as conductors, but the second draft will probably force us to do so, and judging by the conditions in the foreign countries and the way the women are serving there, it is quite apparent that our women could serve efficiently as conductors. Putting them on as motormen, of course, would come afterward, and only if we were tightly caught for workers."

Herbert Warren, vice-president and general manager of the Duluth (Minn.) Street Railway, recently engaged women for work outside of the office of the company in which female labor had never before been used. Among the duties which will be intrusted to some of these women is the cleaning of cars. Mr. Warren is reported to have said:

"We will have a private room ready for the accommodation of the women within a few days. Suggestions for fitting out the room for their convenience have been asked of the Young Women's Christian Association. We do not expect any difficulty in getting a crew of the women for the work. This is principally light work with the same pay as is now being paid men,"

According to the paper which quoted Mr. Warren the employment of women as conductors on cars is not to be adopted immediately, but applications have been received from a large number of women who desire to become conductors, since the announcement was made that the company was considering their employment as car cleaners and for other work.

Michael Conner, superintendent of the Danville Street Railway & Light Company, Danville, Ill., controlled by the Illinois Traction System, is another railway man who has expressed himself recently to the press with respect to the availability of women for certain classes of electric railway work. He is quoted as follows:

"I see no reason why women could not serve as conductors. They are capable and quick, and I apprehend no difficulty at all if it becomes necessary to employ them. To be sure, there is no shortage of men yet; and we will not seriously consider the employment of women until we are unable to secure men for these positions. But if the war continues, it will undoubtedly take a large number of our men and in that event I see no other way than to replace them with women workers."

Subway Ordinance an Election Issue

The Cleveland, Ohio, subway ordinance was defeated by a vote of fifteen to eleven in the City Council on Sept. 5 On demand of the committee which circulated the petitions, the ordinance will go to a vote of the electors on Nov. 6. Mayor Davis declared at the meeting that he was just as much in favor of a subway and street railway terminal now as he has ever been and that he will take part in the campaign for the ordinance before the election. The vote was partisan, except for one member, who voted with the administration forces for the ordinance.

On Sept. 10 a resolution was introduced in the Council proposing that plans for a subway and terminal station be placed in the hands of the city-planning commission. By a vote of fourteen to twelve it was decided to lay this on the table. Councilman McGinty, the author of the resolution, said that the ordinance, which will go to a vote of the electors at the fall election, will turn control of the proposed subway and street railway terminal over to a commission appointed under a state law and that control of the terminal by this commission will give it authority over the street railway itself. Other members of the Council contended that the people should decide whether or not they want a commission and that by submitting the new ordinance at the election they will have an opportunity to express their wishes.

Hearing on Loop Operation

Officials of the Brooklyn (N. Y.) Rapid Transit Company testified further on Sept. 7 at the continuation of the hearing begun on Aug. 20 by the Public Service Commission for the First District of New York with the purpose in view of inquiring into operating conditions in the Centre Street loop subway and ascertaining when it will be possible for the company to substitute steel cars for the wooden ones now in service on that short line. John J. Dempsey, superintendent of the elevated lines of the company, admitted that ninety cars were stored daily on two of the tracks in the Centre Street loop between the morning and evening rush hours. He claimed that such storage was unavoidable because operating conditions made it necessary to use at least two tracks eastbound in the evening rush hour, leaving only one open for westbound traffic. He explained the precautions that are taken to avoid fire. A. M. Williams, counsel for the company, said there was no objection to using steel cars and that 500 steel cars had already been ordered for other lines, but that changes were necessary on the elevated structure in East New York before it would be possible to use the steel cars on the Centre Street line. The commission's experts will investigate and report in two weeks.

Increase in Wages in Chehalis.—The North Coast Power Company, which operates an electric railway between Centralia and Chehalis, Wash., recently granted an increase in wages of 2½ cents an hour to platform men.

Increase in Wages in Oil City.—The Citizens' Traction Company, Oil City, Pa., has announced an increase of 2 cents an hour in the wages of motormen and conductors. The new scale ranges from 26 to 32 cents an hour, dependent upon the length of service.

Wage Request in Kansas City Formulated. — The new union of street railway employees in Kansas City, Mo., has formulated its proposed wage schedule, which is understood to have been forwarded to Detroit, for inspection by the national organization, before being submitted to the Kansas City Railways.

Municipal Railway Employees Strike.—The employees of the Edmonton (Alta) Radial Railway, operated by the city, went on strike on Sept. 2 to enforce their demands for an increase in wages. The Council made an offer alternative to the request of the men. The terms of the proposal of the city were considered by the men to be unsatisfactory.

Three New Chapters of American Association of Engineers.—The American Association of Engineers has granted charters to chapters in St. Paul, Indianapolis and Milwaukee. This makes a total of seven chapters which have been organized since the association was incorporated about two years ago. The total enrollment of the national organization is more than 2200.

Wage Award Accepted by Toronto Railway.—It was announced on Sept. 6 by R. J. Fleming, general manager of the Toronto (Ont.) Railway, that the company had accepted the award made by the board of conciliation appointed to consider the question of wages, hours, etc., between the company and its employees. The men are now receiving the increased wages. A summary of the award made by the board appeared in the ELECTRIC RAILWAY JOURNAL of Sept. 1, page 368.

Increase in Wages in Spokane.—The Washington Water Power Company, Spokane, Wash., increased the wages of its trainmen 2 cents an hour on Sept. 1. In May the company advanced wages 2 cents an hour. The men on the local lines of the Spokane & Inland Empire Railroad in Spokane are seeking an advance in pay. The average wage on these lines is 32 cents an hour. E. E. Lillie, superintendent at Spokane, is reported to have said that the matter will

be considered in conference with the representatives of the men.

Preparing for Oakland Arbitration.—The first meeting of the mediation committee which was appointed to consider the proposal for new wages and changes in working conditions for the employees of the San Francisco-Oakland Terminal Railways, Oakland, Cal., was held on Aug. 30, at the city hall in Oakland. It was proposed to hold nightly meetings beginning Sept. 11, to investigate the claims of both sides. As a basis of settlement expert testimony will be taken as to the cost of living. The issues involved were reviewed at length in the Electric Railway Journal for Sept. 1, page 365.

Increase in Wages on Kansas Road.—The Joplin & Pittsburg Railway, Pittsburg, Kan., has entered into an agreement with the local Amalgamated Association under which the trainmen will receive 30 cents an hour the first year, 31 cents an hour the second year and 32 cents an hour the third year. This is an increase of 5 cents over the old scale. The men originally requested an advance of 10 cents. The first counter proposal of the company was for a raise of 3 cents. Some time ago the company readjusted the wages of its power employees. The settlement reached with these men was reviewed in the Electric Railway Journal of July 28, page 158.

Municipal Railway Wage Question Settled.—The finance committee of the Board of Supervisors of San Francisco, Cal., has passed upon practically all the wage matters affecting municipal employees which were before it. The first big problem the finance committee had to face was the petition for increased pay by the platform men of the Municipal Railway. The men were getting $3 for eight hours. They wanted $3.50. The Mayor and the Board of Works joined the men in the request just as it was ready for passage by the committee. The members of the committee were doubtful at first about the ability of the system to operate at a profit with the advance in effect, but finally decided the matter in favor of the men.

Strike in Meridian.—The trainmen in the employ of the Meridian Light & Railway Company, Meridian, Miss., went on strike recently. A flat scale of 22 cents an hour had been in effect. The men demanded 26 cents. The men rejected an offer of 23 cents an hour made by the local management without consultation with the home office of the company in New York and turned in their cars as a means of enforcing their demands. Later they agreed to return to work, pending advices to the local management from the New York office. The period for which the men agreed to remain at work temporarily under the old scale was one week. The matter was finally settled within a few hours of the period of grace under an agreement calling for 25 cents an hour.

Wage Adjustment Conditional on Fare Changes. — The trainmen in the employ of the Laurel Light & Railway Company, Laurel, Miss., have returned to work after having been out on strike for a week. The men will receive immediately an increase in wages to 20 cents for the first six months, 22 cents for the second six months and 24 cents thereafter. The settlement was affected in conference with a committee of the business men of Laurel and will include finally an increase in the city fare to 6 cents with strip tickets and changes in the interurban fares. As soon as these fare changes have been formally approved by the Council and are put into effect by the company, the wages of the men will be further advanced to a scale calling for 22, 24 and 27 cents based on the length of service.

Day Service Normal in San Francisco.—Service on the lines of the United Railroads, San Francisco, Cal., was almost normal on Sept. 11. The company is ready to operate on night schedule if it receives full night police protection and hoped to resume regular night service again by Sept. 15. The police force has been greatly increased recently and strike disturbances have practically disappeared. Company officials state that the striking car men, in groups and individually, are asking that they be taken back and restored to their former positions. The city started negotiations with the Ocean Shore Railroad officials on Sept. 11 in an endeavor to arrange for hourly service on this line to the Excelsior and Glen Park districts, which still are without adequate car service.

One Philadelphia Contract Signed.—Jerome H. Louchheim, president of the Keystone State Construction Company, has announced that his firm has signed two of the delivery loop contracts for the Philadelphia high-speed lines. The contracts signed are for the Locust Street section to cost $1,713,715, and the Arch Street section to cost $1,575,760. The other contracts which had been awarded to the Keystone State Construction Company for the Broad Street sections are held up for the present in hope of better conditions as regards material delivery. As noted in the Electric Railway Journal of Sept. 8, page 408, the Philadelphia Subway Contracting Company still has under consideration the matter of signing the awards made to it, while Smith, Hauser & MacIsaacs, New York, rejected their award on the basis of the present economic situation.

Washington Companies Complain About High Costs.—On Sept. 4 representatives of practically every electric railway in the State of Washington appeared before the State Board of Equalization at Olympia and complained to the effect that materials, labor and other costs had gone up; that the lines had not been able to raise rates, and that the situation was very serious. The companies also protested against the competition of the stage lines, jitneys and automobiles. They all asked for reductions in their taxes. Among the companies represented at the meeting were the Everett Railway, Light & Power Company; Pacific Traction Company; Puget Sound Traction, Light & Power Company; Tacoma Railway & Power Company; Western Washington Power Company; Pacific Northwest Traction Company; Puget Sound Electric Railway; Walla Walla Valley Railway, and the Washington Water Power Company.

Civic League Reports Against Proposed Settlement Ordinances in St. Louis.—The Civic League of St. Louis, Mo., on Sept. 7 submitted to the public utilities committee of the Board of Aldermen information and reports on street railway settlements in other cities similar to the proposed mill tax compromise and franchise ordinances in St. Louis, indicating that such compromises were generally unsatisfactory and often resulted in further complications. The league probably will endeavor to have the Board of Aldermen employ a franchise expert to advise it relative to the proposed ordinances. Louis F. Budenz, secretary of the league, has announced that an organization composed of twenty or more civic and ward improvement associations will issue a report urging the defeat of both of the proposed settlement ordinances in St. Louis. These organizations have agreed to invoke the referendum on the ordinances if either one of the settlement grants which are now under consideration is passed by the Board of Aldermen.

Program of Association Meeting

Chamber of Commerce of the United States

The war convention of American business, under the auspices of the Chamber of Commerce of the United States of America, will be held at Atlantic City, N. J., Sept. 18-21. Its purpose is to consider: (1) The duty that business owes the government in war; (2) how may the business of the country render greater service in winning the war; (3) ways and means by which business may most readily adjust itself to the conditions produced by the war; (4) for what readjustments after the war business must prepare. There will be an address on the first day by Secretary of War Baker, who will speak as president of the Council of National Defense and will indicate what services business men can render to the government in connection with its prosecution of the war. There will also be addresses by Secretary of the Interior Lane, Frank A. Scott, chairman of the War Industries Board, and George M. Reynolds, president of the Continental & Commercial Bank of Chicago. The second day will be devoted largely to group meetings of the Retail Trade Conference and special meetings of the Foreign Trade Council. On the third day the subjects of banking and finance, foreign trade, industrial relations, food and fuel, will be discussed. The convention will close Sept. 21.

In the evenings there will also be addresses. Among others scheduled at the evening meetings are Boris Bakhmeteff, Russian Ambassador, Herbert C. Hoover and Lord Northcliffe, chairman of the British Mission.

Financial and Corporate

Annual Reports

Brandon Municipal Railway

Comparative figures of operation of the Brandon (Manitoba) Municipal Railway for the last four years ended June 30 follow:

	1914	1915	1916	1917
Passenger car-miles	269,679	269,736	235,281	305,878
Fare passengers carried	916,723	782,011	627,739	839,375
Earnings per car-mile (cents)	16.44	13.33	12.43	12.20
Average fare per revenue passengers (cents)	4.91	4.52	4.52	4.45
Operating expenses per car-mile (cents)	18.90	10.53	12.18	10.61
Total earnings	$44,344	$35,969	$29,258	$37,323
Total operating expenses	$50,972	$28,395	$28,660	$32,451
Deficit	$6,628	.....	.....	.....
Net earnings from operation	.....	$7,574	$598	$4,872

According to the foregoing, the passenger traffic and the net earnings showed a substantial gain in the last fiscal year. It should be observed, however, that the decreased revenue for 1916 was due to the system being closed down for ten weeks during January, February and March, as noted in the ELECTRIC RAILWAY JOURNAL issue of Nov. 11, 1916, page 1037. The 1917 decrease in the average fare per revenue passenger was due to the City Council granting a four-hour increase in time on the workmen's tickets. This was granted in February and has been a failure. The earnings per car mile decreased further after the extra time was granted.

The increased expenses of 1914 over other years were partially due to the cars being operated on the two-man system for the first eight months. To make a fair comparison the wages of conductors at $7,678 should be deducted, which would make operating expenses for 1914 total $43,293.

Puget Sound Traction, Light & Power Company

The Puget Sound Traction, Light & Power Company, Seattle, Wash., has filed its report with the Washington Public Service Commission for the calendar year ended Dec. 31, 1916. The report covers the electric railway light and power utilities of Seattle, power in Tacoma, and railway, light, power nad gas in Bellingham. The three interurban lines, the electric railways in Tacoma and the electric railway, light, power and water companies of Everett, are not a part of the Puget Sound Traction, Light & Power Company, but are controlled by it.

The annual reports formerly were for the fiscal years ending June 30. They are now made out by calendar years. The last period of normal traffic, that is, before automobile and jitney competition had noticeably affected traffic, was covered in the report of June 30, 1914. Comparison of the two reports—1916 with 1914—shows a decrease in operating revenues, stationary operating expenses, a decline in traffic, a decreased average rate of fare and an actual increase in service.

Revenues from the operation of railway properties were reduced from $3,926,517 in 1914 to $3,297,367 in 1916, a loss of $629,140. On the operating expense side, however, the reduction was only $15,866 in the same period. At the same time the number of passengers carried per annum declined from 106,214,389 in 1914 to only 89,413,079 in 1916. This is a loss of 16 per cent in traffic which can reasonably be placed on automobile and jitney competition.

But while the company was sustaining these losses the reports show that service, as measured in car miles, was increased. Car miles increased by 352,962 in 1916 as compared to 1914. The car miles in 1914 were 13,447,047 and 13,800,009 in 1916. In other words, a decline in traffic was met by an increase in service.

The average rate of fare in 1914 was 3.62 cents. In 1916 it was 3.58 cents. The average number of passengers carried per car per mile in 1914 was 7.9 and in 1916 it was 6.4. Regular fare passengers dropped from 77,007,953 in 1914 to 66,027,760 in 1916. There were 19,967,058 passengers carried on transfers and 3,816,596 free passengers carried in the latter year. Taxes for the company for the year aggregated 582,879, while the total for all the companies under its control in the Puget Sound district was $804,653.

Reasons for Fort Wayne Default

Circular to Security Holders of Fort Wayne & Northern Indiana Traction Company Reviews Problem of the Company

The conditions which contributed to the default in the payment of interest due on Sept. 1 by the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., to which brief reference was made in the ELECTRIC RAILWAY JOURNAL of Sept. 8, page 414, are reviewed at length in the circular which was sent to the security holders. As stated previously it is hoped that the necessity for the appointment of a receiver may be avoided. The circular says that within the next two years $1,400,000 should be expended in new capital, and that this sum cannot be obtained except by the reduction of the fixed charges. To this end it is proposed to reorganize and recapitalize the Fort Wayne & Northern Indiana Traction Company and to reduce the bonded debt, particularly that of the Fort Wayne & Wabash Valley Traction Company and the Lafayette & Logansport Traction Company. The circular follows in part:

CONTRIBUTING FACTORS

"Since 1910, there has been a succession of unfortunate events in connection with this property. In 1910, the Bluffton accident occurred, with very heavy damages. In 1913 the flood which swept over Indiana and Ohio caused a reconstruction expense of $200,000. In 1915 the jitney seriously affected the earnings of the company. In the same year a strike occurred, accompanied by a boycott lasting seven months and entailing a loss to the company of approximately $250,000.

EXPENSES OUTSTRIP INCREASES IN EARNINGS

"The increased gross earnings have been more than exhausted by the increased cost of operation and the reports for the last three months have shown continual deficits. The increased cost of coal alone for six months as against the preceding year was $84,369. It is to be remarked, too, that apart from increased operating expenses, the rates of carrying passengers in the cities have been kept the same by law, and the interurbans, without regard to cost, have not been allowed an excess of 2 cents a mile per passenger. Since the organization of this property in 1904 the wages of the motormen and conductors have been advanced six times. Had it not been for the generally fair disposition of the community as a whole and of the public press, the property would have been long since financially ruined.

$1,400,000 NEEDED FOR IMPROVEMENTS

"Circumstances have, as outlined, been unfortunate. It has been impossible during the last six months, in view of the pressure of current obligations arising from the expenses of the strike, and the increased cost of operating and maintaining the property, and because of large additional expenditures for improvements imperatively required, to accumulate the interest accruing upon the bonds of the Fort Wayne & Northern Indiana Traction Company and upon the bonds of the Fort Wayne & Wabash Valley Traction Company, and upon the collateral trust notes of $1,200,000.

"Nor under all of the existing circumstances could banking accommodations be made to secure the money necessary to meet such interest obligations and tide over the present emergency. Inquiry by bankers into the situation has shown the necessity for some protective capital to provide for immediate improvement of the existing equipment and further extension of the power plant. Within the next two years there should be expended in new capital at least $1,400,000. This money cannot be obtained except by a reduction of the fixed charges.

"Upon two occasions the stockholders and others interested in the company have provided for the protection of the property in its development, and furnished the sums requisite for the semi-annual interest upon its principal issue of bonds. While those principally interested will cooperate in the proposed reorganization, these gentlemen are unwilling, apart from others interested, to take further serious financial responsibility, and a default in the payment of interest must therefore occur upon the three classes of securities on Sept. 1, 1917."

Robert M. Feustel, of Sloan, Huddle, Feustel & Freeman, consulting engineers, who was elected president of the company in January, 1916, issued a statement to the public as follows:

"The directors of the company have been working on the financial problem for the past six months. It was apparent to the directors that the revenues were not sufficient to meet the increasing operating costs. Additional money was needed for improvements and yet sufficient funds to pay the fixed charges on money already invested were not available after operating expenses were paid. The first aim of the directors has been to make sure that all unsecured creditors of the company were fully protected. The company has been reducing its floating debt for the past six months and is now in a position where all accounts can be taken care of out of earnings.

"A committee will be formed at once and will push vigorously the formulation of plans for a financial reorganization of the company. This will mean a sacrifice on the part of the present security holders to obtain a plan which will provide new money needed for improvements; the reorganization, however, should not affect the plans of the company to give increased and improved service to Fort Wayne and other cities.

"It will be noted in the letter sent to the security holders that the company has suffered unavoidable financial losses, but with the co-operation and good will of the public we expect not only to render satisfactory service, but to make a fair return to the investor as well. My short experience in Fort Wayne as president for this company gives me every confidence that the public will co-operate with us in this problem."

The Fort Wayne & Northern Indiana Traction Company operates 81 miles of city line and 139 miles of interurban line. The interurban lines connect Fort Wayne, Huntington, Andrews, Wabash, Peru, Logansport, Lafayette and Bluffton.

Providence & Fall River Line Sold

Road to Be Scrapped by the Purchaser Who Bought It in at Foreclosure

The Providence & Fall River Street Railway, operating a line 12½ miles long between Providence and Fall River, known as the "Snake" Line, was sold at public auction at noon on Sept. 12 at the Swansea carhouse, to Carl Andrén, 45 Oliver Street, Boston, Mass., for $68,000. The sale was made by the Industrial Trust Company, Providence, trustee for the bondholders, under a decree entered in the United States District Court at Boston.

The company was incorporated under the laws of Massachusetts in 1901. In 1911 a branch running between Warren and Swansea was discontinued. The company has twenty-five cars and purchases its power from the Narragansett Electric Lighting Company, Providence. J. F. Shaw is president of the company; C. C. Pierce, vice-president, and A. W. Clapp, secretary and treasurer. The company reported for the year ended June 30, 1916, gross earnings of $50,734, operating expenses of $42,099, and net earnings of $8,635. The fixed charges were $14,017, making a deficit for the year of $5,382. The bonded debt of the company was $165,000. The capital stock was $165,000. A committee of bondholders representing $157,000 of the $165,000 of bonds acted in the matter of the court action in Boston.

Carl Andrén, the purchaser of the property, is proprietor of the Carl Andrén Company, car equipment engineer. He stated after the purchase of the road that it would be completely dismantled and thrown upon the junk pile within thirty days at the latest.

Tax Relief for Idaho Companies

$10,473 Saved to Boise Valley Traction and Boise Street Railway Through Reductions in 1917 Valuations

The State Board of Equalization at Boise, Idaho, has reduced the valuations of the properties of the Boise Valley Traction Company and the Boise Street Railway from $9,000 a mile to $5,000 a mile. The $9,000 a mile valuation was fixed in 1916. The total valuation of properties owned by the Boise Valley Traction Company was fixed that year at $707,130. The valuation as fixed for 1917 is $392,850. The company paid about $3 on the $100 of valuation in 1916 or $21,213 on the $707,130. The same estimate of $3 on the $100 is used in determining what the company shall pay in taxes next year on this year's valuation. On the valuation of $392,850 as fixed recently the tax is reduced to $11,785, a saving of $9,428.

Last year the valuation of the property of the Boise Street Railway was fixed at $62,730. This year the valuation is fixed at $34,850. The company paid $2,181 in taxes this year on the 1916 valuation. Next year it will pay $1,136 on the 1917 valuation. The saving is approximately $1,045.

In taking a rate of $3 on the $100 valuation as the basis upon which to compute the sum total of the taxes to be paid by companies, the tax levies made by the State, county, city, school districts and highway districts were totaled and averaged.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.—The plan for the sale of the property of the Chambersburg, Greencastle & Waynesboro Street Railway to the Hagerstown & Frederick Railway has been declared operative. The Bank of Waynesboro has notified the holders of the preferred stock and the common stock of the Chambersburg, Greencastle & Waynesboro Street Railway to deposit their certificates. The terms of the sale have not been made public, but it is stated that the holders of the Chambersburg, Greencastle & Waynesboro Street Railway stock will receive about one-eighth of the purchase price in cash and the remainder in fifteen-year notes, bearing interest at 5 per cent per annum. In addition they will receive a bonus in the form of common stock of the Hagerstown & Frederick Railway.

Chicago (Ill.) Railways.—The Chicago Railways has filed a petition with the Illinois Public Utilities Commission asking permission to issue additional $2,230,189 of first mortgage 5 per cent bonds to cover special improvements.

Humboldt Transit Company, Eureka, Cal.—The Humboldt Transit Company has filed with the California Railroad Commission an application for authority to issue a 6 per cent note jointly with William Rand to the First National Bank, Eureka, dated July 31, 1917, for $20,000 and to issue $40,000 of first mortgage 5 per cent bonds as collateral security for the payment of the note. This note is to be issued to free the company from a similar note issued to the First National Bank, Eureka, under order of the commission made on Sept. 3, 1915.

Jacksonville & Peoria Railway, Jacksonville, Ill.—W. C. Fordyce, George L. Edwards and J. C. Van Riper, St. Louis, and C. A. Caldwell, Alton, Ill., are members of the bondholders' committee of the Jacksonville & Peoria Railway which has instituted suit against John J. Cummings, Plana, Ill., asking for an accounting of $500,000. The suit was filed in Chicago. The Jacksonville & Peoria Railway was thrown into the hands of receivers in Indiana three years ago. Mr. Cummings resigned from the committee, and then, it is charged, instead of carrying out a contract made with the other members to get sufficient capital to rehabilitate the road, he, with the American Trust Company, St. Louis, got control.

New Orleans Railway & Light Company, New Orleans, La.—A recent visit to New Orleans by a representative of H. L. Doherty & Company, New York, N. Y., gave rise to the rumor that that company contemplated taking over the New Orleans Railway & Light Company. The *Times-Picayune*, in a recent issue, said: "D. D. Curran, president

of the New Orleans Railway & Light Company said there was nothing to the report. A. B. Patterson, New Orleans representative of Henry L. Doherty & Company, also denied there was anything to the report."

Pittsburgh, Mars & Butler Street Railway, Pittsburgh, Pa.—The Pittsburgh, Mars & Butler Street Railway has filed for record with the county recorder of Allegheny County a mortgage on its property given in favor of the Dollar Savings & Trust Company, Pittsburgh, as trustee, to secure an issue of $1,250,000 of bonds, the proceeds of which will be used for improving the road. The Pittsburgh, Mars & Butler Street Railway is the successor to the Pittsburgh & Butler Street Railway, the property of which was sold under foreclosure to R. H. Boggs last May. Mr. Boggs is president of the Dollar Savings & Trust Company. In addition he is president of the Pittsburgh, Harmony, Butler & New Castle Railway.

Tidewater Power Company, Wilmington, N. C.—John H. Nickerson, Jr., New York, N. Y., is offering $350,000 of Tidewater Power Company three-year 6 per cent general mortgage gold bonds dated Aug. 1, 1917, to yield 7 per cent. The bonds are redeemable at 101 and interest on sixty days' notice.

West End Street Railway, Boston, Mass.—The West End Railway recently sold to R. L. Day & Company and Merrill, Oldham & Company, Boston, Mass., an issue of $500,000 of 7 per cent thirty-year bonds. This is the second issue of 7 per cent securities to be sold by the road within a few weeks, it having previously disposed of $1,581,000 of three-year 7 per cent notes to Lee Higginson & Company.

Electric Railway Monthly Earnings

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., July,		'17	$105,383	*$85,359	$20,024	$27,540	†‡$7,187
1 "	"	'16	97,834	*76,352	21,482	27,831	‡†6,178
7 "	"	'17	615,633	*539,548	76,085	193,023	‡†116,113
7 "	"	'16	556,056	*464,850	91,206	178,491	‡†85,934

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., July,		'17	$992,238	*$703,075	$289,163	$100,358	‡$211,358
1 "	"	'16	932,505	*587,455	345,050	98,634	‡270,260
7 "	"	'17	5,755,899	*4,491,762	1,264,137	675,354	‡715,300
7 "	"	'16	5,428,057	*3,667,169	1,760,888	690,080	‡1,200,343

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., July,		'17	$314,202	*$219,015	$95,187	$64,757	$30,430
1 "	"	'16	258,367	*151,584	106,783	62,987	43,796
12 "	"	'17	3,418,246	*2,173,588	1,244,658	768,991	475,667
12 "	"	'16	2,760,532	*1,642,212	1,118,320	751,943	366,377

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m., July,		'17	$54,436	*$33,179	$21,257	$7,982	‡$13,321
1 "	"	'16	44,930	*30,663	14,267	7,987	‡6,325
7 "	"	'17	228,996	*204,045	24,951	55,890	‡†30,628
7 "	"	'16	213,182	*173,964	39,218	55,887	‡†16,385

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m., July,		'17	$49,158	*$45,533	$3,625	§$5,649	‡†$1,083
1 "	"	'16	50,044	*44,504	5,540	§6,015	‡591
7 "	"	'17	323,604	*322,757	847	§52,338	‡†44,230
7 "	"	'16	306,233	*348,873	†42,639	§61,970	‡†60,360

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m., July,		'17	$564,261	$339,142	$225,119	$61,602	$163,517
1 "	"	'16	481,143	241,840	239,303	94,493	144,810
7 "	"	'17	3,638,014	2,214,956	1,423,057	556,377	866,680
7 "	"	'16	2,860,642	1,401,485	1,459,157	673,787	785,370

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m., July,		'17	$388,002	*$257,983	$130,019	$84,221	‡$56,142
1 "	"	'16	326,707	*196,867	129,840	68,816	‡61,348
12 "	"	'17	4,344,363	*2,749,919	1,594,444	923,281	‡714,354
12 "	"	'16	3,674,096	*2,165,626	1,508,470	766,875	‡753,095

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., July,		'17	$610,130	*$419,110	$191,120	$122,947	‡$68,941
1 "	"	'16	569,275	*371,502	197,773	120,688	‡78,599
7 "	"	'17	3,439,820	*2,783,667	656,153	841,101	‡†100,391
7 "	"	'16	3,297,887	*2,393,361	904,526	800,469	‡190,397

WESTCHESTER STREET RAILWAY, WHITE PLAINS, N. Y.

1m., July,		'17	$25,393	*$25,364	$29	$2,208	†‡$2,145
1 "	"	'16	23,125	*22,400	725	1,815	†‡1,064
7 "	"	'17	140,590	*162,065	†21,475	14,659	†‡35,936
7 "	"	'16	141,660	*149,771	†8,109	12,373	†‡20,304

*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income, and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

P. F. Sullivan on One-Man Cars

President of Bay State Street Railway Explains Their Advantages to Trainmen

Under the heading "Why Every Bay State Employee Should Welcome the Efficiency Car," President P. F. Sullivan of the Bay State Street Railway gives the reasons to the trainmen in a recent issue of the company's publication. He says in part:

"I am going to talk to you frankly about the so-called one-man car which we have asked the Public Service Commission to permit us to operate on certain lines. There is only one reason why this type of car should be adopted: it will help us give the public better service. We may as well recognize at the start that every machine, no matter how much its introduction may have been opposed, that has helped men serve the public better has won its way to success. We are introducing the one-man car because in the cities where it has been thoroughly tested and tried out it has given such satisfaction that no longer is there a reason why fair-minded men should oppose it for any but selfish and anti-public reasons.

"You are interested, especially you blue-uniform men, in the charge that has been made that this car will throw some of you out of work. No man—and this I say to you as earnestly and as sincerely as I know how—no man who has been a true Bay State worker need ever fear that he will be thrown out because of the introduction of labor-saving machinery. And it must also be said on the other side that no true Bay State employee will ever oppose either by word or deed the introduction of equipment which will enable the company to render more satisfactory service to the public.

One-Man Cars Are of Benefit to All

"At the present time, when the company is facing the greatest financial crisis in its history, every loyal man in the employ of the company must be ready and willing to bring into the organization any man or any machine that will help cut unnecessary expenses, improve the service, and assist in any other way to make it possible for the company to give better service. The financial condition of the company at the present time is such that unless unnecessary expenses are cut, unless there is a greater display of willingness on the part of all employees to do more and better work, unless there is true co-operation all along the line, the company will find it necessary, in self-defense, to discontinue all of its non-paying lines. We hold that any order to continue to operate non-paying lines is confiscatory and therefore illegal, and we believe that the people of the State will back us up when we refuse to continue the operation of a line which costs us 40 cents for every 6-cent passenger carried. The law cannot compel you to work for $1 a day when your actual living expenses are $2.50.

"Should we discontinue operating all our non-paying lines, many men will be forced to leave our employ. We wish to avoid inflicting any hardship on those men. For that reason, and for the reason that we are trying to give the maximum service at the lowest cost, we are planning to substitute one-man cars for some of the present two-man cars and to use two one-man cars on some lines where we are now using one two-man car. This we are doing in the interest of better service to the public.

"Men are leaving the company nearly every day. The draft is taking many. Others have enlisted. Still others have gone voluntarily into other work. The one-man car does not mean the discharge of men who wish to stay. Do not let anyone make you believe anything to the contrary. You remember the old story of the goose that laid the golden eggs. Do not let anyone persuade you to let narrow selfishness warp your eyesight and keep you from seeing that in demanding too much you will only increase the danger of losing what you now have."

Portland Fare Hearing

Company Asks Increase Partly to Offset Higher Wages Requested by Its Men—Commission Suggests Decreased Service

As reported last week the Portland Railway, Light & Power Company, Portland, Ore., has petitioned the Oregon Public Service Commission for permission to increase its fares to 6 cents. The company declared that the increase is necessary if the advance in wages recently demanded by its platform men is to be granted. It was suggested by representatives of organized labor that an investigation be conducted by the commission to determine whether the company's revenues are adequate to meet the demands of the employees, and if not, that it be permitted to revise its tariffs sufficiently to meet the requirements of a higher wage scale and easier working conditions. Franklin T. Griffith, president of the company, appeared before the commission to urge that if the matter were to be taken up, it be done expeditiously, and that to save time the company's accounts be inspected by the commission's investigators before the day of hearing.

The first hearing was held in Portland on Sept. 6. President Griffith testified that service had increased 13.4 per cent over that of last year. Chairman Miller of the Public Service Commission stated that increased service may not be absolutely necessary and that, rather than increase the fare from 5 cents to 6 cents, because of increased operating expenses, the solution of the problem may be the reduction of service.

The first protest against the company's application for higher rates was made by members of Sumner Post, G. A. R., who threaten to aid in the restoration of jitney service in case the Public Service Commission decides to grant the increase.

The local branch of the Brotherhood of Railway Trainmen on Sept. 6 submitted to the Public Service Commission a resolution opposing the higher fares, declaring that the company is using the demands of its employees for a basic eight-hour day and a 16 per cent increase in wages as a subterfuge to influence the commission. This attitude is contrary to that of the employees of the company, who, on Sept. 5, requested the commission to allow the increase. The protesting trainmen claim that the company is amply able to grant the men's demands without increasing its income from fares.

Parades Conflict With Service

Denver Tramway Runs Advertising Before Parade Days to Notify Public of Its Attempts to Maintain Service by Rerouting Cars

An advertisement was run in the daily papers in Denver, Col., on the day before Labor Day calling attention to the attempt the Denver Tramway would make to maintain normal service through rerouting cars and splitting runs in order to serve the public despite the blockade resulting from the parade on the main car-line streets. The advertisement explained that the parade would cause an unavoidable interruption and delay to the service and listed the lines which would be re-routed and the course these cars would take. It is planned to run an advertisement of this kind just before every parade held in the town during the coming year. In commenting on the company's efforts to inform the public, J. C. Davidson, publicity manager, said:

"We had three purposes in running this advertisement; first, to make as many people as possible realize that all the rotten car service on Labor Day was not the fault of the tramway, but of the parade; second, to give some very useful information to the public in order to minimize the inconvenience caused by these re-routings; third, to create a public sentiment against parades on our three busy downtown streets and thus pave the way for action by city officials some time in the future to keep the parades off these streets where they cause so much mental anguish on the part of the tramway and corns and blisters on the part of the car riders whom the parade forces to become pedestrians."

Overcrowding Decision Revoked

Toronto Railway Upheld by Imperial Privy Council in Appeal from Decision Convicting It of Maintaining a Public Nuisance

The Imperial Privy Council has allowed the appeal of the Toronto (Ont.) Railway from its conviction by the Toronto Supreme Court for operating overcrowded cars. The action was originally taken against the company at the instance of the city under the public health act. The company was charged with maintaining a public nuisance by overcrowding its cars, and a conviction was obtained, notwithstanding arguments for the defence, which, while admitting the overcrowding, showed that, in law, it was not maintaining a public nuisance. This view was held by the Privy Council. In the Judicial Committee's opinion the wrong done was a civil one. The judgment reads, in part, as follows:

"The obligation of the appellants was a contractual obligation to the Corporation of Toronto. There was no duty to the public generally. These cars were on the street in recognition of a public right which the Ontario Legislature and the Toronto Corporation have thought it advantageous to interfere with. The cars were not less thereby the property of the appellants, which the public could only enter by invitation. Whatever conditions in the grant of the appellants' title the corporation had contracted for obtained merely between them and the appellants. The overcrowding was not a matter that affected the public as such, but only those members of the public who have obtained from the appellants licenses to enter the cars."

This matter has been before the courts in Canada for several years. It is said that the case in various phases has been a consideration in several municipal elections. It is also believed by some that it is not the desire of the city to have the situation remedied but that it wishes to influence public opinion during the last years of the company's franchise, with the intention of taking over the property.

Harrisburg Survey Completed

Bion J. Arnold Reports to Harrisburg Railways, by Which He Was Retained to Inquire Into Traffic Conditions in the Pennsylvania Capital

The work of Bion J. Arnold, Chicago, who for several months has been making a survey of the service rendered by the Harrisburg (Pa.) Railways for the company with a view to recommending changes for the improvement in the transportation facilities in Harrisburg, Steelton, and other nearby towns, has been completed. Many immediate betterments and a comprehensive plan of developments covering a period of years are outlined in Mr. Arnold's report. The report is a document of 125 pages of typewritten matter besides maps, diagrams and analytical and explanatory tables. That the survey will result in many immediate improvements in the service is assured by directors of the company. In many respects Mr. Arnold's recommendations are identical with the suggestions made by the Public Service Commission of Pennsylvania in a letter to Frank B. Musser, president of the company, as referred to in the Electric Railway Journal for Sept. 8, page 416.

The whole subject of electric railway transportation in Harrisburg and suburbs is treated in a broad and comprehensive manner, with consideration for the future, and the close relation between adequate service and a proper development of the city is indicated in several ways. The removal of the Union station from its present site to a point between Walnut and Market Streets is recommended together with a combination viaduct and concourse to solve the present Walnut Street bridge problem. The report also touches upon the widening of the Market Street subway and of Third and Walnut Streets and several other thoroughfares. Treatment of the problems in the Capitol Park zone could not be discussed definitely until the State and city plans for that district are in more concrete form, but it is urged that such matters as the removal of the Union station to Walnut Street and the question of a State or Walnut Street viaduct should be made the subject of immediate

conferences on the part of representatives of the State, the city, the railroads and the electric railway.

A new through route to Steelton, by way of Second and Paxton Streets, as recommended by the Public Service Commission; improvement of the Nineteenth Street service to Steelton; rerouting of cars in Third Street; double tracks laid in Market Street and Third Street; the elimination of short stops; a cross-town line through the Herr Street subway development of the Nineteenth Street route to Steelton, and the widening of the Market Street subway are principal points of the many covered by the survey.

Bay State Special-Ticket Hearing

Company Shows Right to Change Rates Voluntarily Established—Some City Representatives Threaten Jitney Reprisals

At a hearing before the Massachusetts Public Service Commission on Sept. 6 relative to the petition of the Bay State Street Railway, Boston, to increase its rates on workingmen's and commutation tickets, representatives of sixteen outlying towns and cities from Fall River to Newburyport were present to remonstrate against the proposed raise. The consensus of opinion was that if the commission grants the requested increase the majority of the communities affected will encourage the operation of jitney lines.

Representatives of the company submitted that the reduced rates at which workingmen's tickets had been sold in the past were due to voluntary arrangement by the company and pointed out that neither the commission nor the Legislature had the legal right to fix class rates below the regular units of fare. This position, it was said, was clearly supported in a decision of the United States Supreme Court in the case of the Lake Shore & Michigan Southern Railroad vs. Smith.

In regard to commutation rates, the representatives of the company laid stress upon the fact that such reduced rates as had prevailed in the past were voluntarily established by the company to aid the development of certain communities. Now, when the company finds itself confronted with a situation where it is selling transportation for less than cost, it feels that it is justified in withdrawing the voluntary rates.

It was stated that after allowing for a 5 per cent traffic loss, the proposed increases in rates would mean a gain of $110,000 a year to the company.

Always Be Careful

That personal safety is dependent on the state of mind of the individual rather than upon any elaborate set of rules is cleverly portrayed in a recent issue of *Trolley News*, published by the United Railways & Electric Company, Baltimore, Md. The article entitled "Multum in Parvo" follows:

"Once upon a Time there was a Gathering at which Everybody was asked to Say Something that would be Helpful to Mankind in avoiding Accidents.

"The first Man to Talk explained very Fully the whole Theory of Accidents and traced their History from the Dark Ages to the Present Time. When He had finished He sat Down and Everybody applauded and was Glad that they had come.

"The next Speaker told of his long Experience in Safety matters and the peculiar Conditions He had Encountered at various Times. And He drew Diagrams and Maps on the Blackboard to show how Persons are Bowled over when they Fail to Observe the Standard Rules of Safety. At the Conclusion of his Talk He was Given a Rising Vote of Thanks.

"Then Another Man Talked for Three-quarters of an Hour, Illuminating His Speech by reciting a Poem of ten Verses. All He said would have filled a Book, and it was generally Agreed that He had handled the Subject better than Any of those who had preceded Him.

"The following Speaker presented a long List of Don'ts. It was 'Don't Do This,' and 'Don't Do That,' and when He had done there was Nothing except Playing Pinochle that Anybody could Do without being Badly Hurt. So He was given the Chautauqua Salute as He Smilingly resumed his Seat.

"Then there was a Serious looking Fellow who Said that He would not Only present the Matter from a New Angle, BUT that He would Prove every Word He said. He had a Model of an Auto, and one of a Cart, and a Car, and a Lamppost, and a Pile of Bricks, and a Yellow Dog, and a Wheelbarrow, and a Soap Box. He put them All together on a Table and Proved to the Satisfaction of his Hearers that the only Way to keep out of the Hospital was to Eat Breakfast in Bed and remain at Home the rest of the Day.

"There were Other Talkers and They were very Eloquent, and Said many Things that would benefit Mankind if they could be Remembered at the Right Time.

"And When Everybody Else had Stopped Talking, which was not until Very Late, a Small Quiet Man who had been in the Rear of the Hall slowly arose.

"'Well, Sir,' said the Chairman of the Meeting, 'We Shall be Glad to Hear Your Suggestion for the Protection of Humanity from Accident and Injury. What Have You to Say?'

"The Small Quiet Man Replied:

"'Always Be Careful.'

"Then He sat Down.

"ALWAYS BE CAREFUL.

"And That is the very Best Safety Rule that You, Dear Reader, can Adopt, and can Impress upon the Members of your Family and your Friends to Safeguard You and Them from Accident and Injury.

"Remember that it Applies at All Times and under All Conditions.

"ALWAYS BE CAREFUL."

Cars Crash on Ohio Road.—Several persons were injured in a collision on the line of the Northern Ohio Traction & Light Company at the "gorge" between Akron and Cuyahoga Falls, on the night of Sept. 9. One of the cars was stopped by its trolley leaving the wire and the other struck it from the rear.

Higher Rates Asked by N. O. T.—Application for higher power rates and passenger fares has been made to the Ohio Public Utilities Commission by the Northern Ohio Traction & Light Company, Akron, to put fares on a basis of 2 cents a mile and to increase power rates about 20 per cent. Higher costs of materials and labor are said to be the reason for the action taken.

Scranton Fare Increase Suspended.—Under an agreement reached by the Public Service Commission of Pennsylvania and the Scranton Railway, which has asked for a 6-cent fare, the company will suspend the increase for the time being. A hearing will be held within a few weeks on the several complaints filed with the commission. The new tariff was to have been effective on Sept. 7.

Service Interruption on Shore Line.—The failure of a turbine at the Saybrook power station of the Shore Line Electric Railway, Norwich, Conn., on Sept. 9 caused an almost complete tie-up in the service. The turbine was supplying practically all of the power since another turbine went out of commission some time ago. Only one car every two hours was operated on the lines where service was continued.

Accident on Public Service Railway.—Twenty-three persons were injured on Sept. 9, about 9 p. m., in an accident on the Public Service Railway, Newark, N. J., when a car ran into an open switch near Pensauken Junction, just outside of Camden, and turned over on its side. The motorman, in describing the accident, said that the arc light at the junction was not lighted and that his headlight went out a few feet from the switch. He immediately reduced the speed of his car but struck the switch at about half speed.

Collision on Schuylkill Railway.—As a result of a head-on collision which occurred recently on the Schuylkill Railway, Girardville, Pa., between Frackville and St. Clair, three people were killed and several others seriously injured. It is said that the northbound car failed to take the siding at St. Clair and instead attempted to make an extra block before the southbound car arrived. The latter had passed a car on the spur at Frackville and had proceeded toward St. Clair. The motorman of the southbound car died soon after the accident.

Car Crews Ask Passengers' Co-operation.—In all the cars of the United Railways, St. Louis, Mo., cards have been placed addressed to the public and signed by the motormen and conductors requesting that patrons be careful in boarding and alighting from cars and thereby help them win bonuses under the plan established by that company. The bonus system went into effect on Sept. 1, and was described briefly on page 165 of this paper for July 28.

Toledo Watching Ohio Rate Case.—The Toledo *Times* states that the Toledo & Indiana Traction Company, the Toledo & Western Railroad, and the Northwestern Ohio Railway & Power Company, Toledo, will increase their rates of fare to practically 2½ cents per mile, in case the recent decision of the Ohio Public Utilities Commission increasing the rates of the Western Ohio Railway to that basis stands. The *Times* regards that as a test case for all the interurban roads of the State.

Cities in New York to Fight Fare Increases.—The cities in New York State in which the electric railways have asked for a 6-cent fare are to have experts to handle their opposition. A recent conference of municipal attorneys in Syracuse was attended by E. W. Bemis, Chicago; F. W. Ballard, Cleveland; T. L. Sidlo, Cleveland, and J. C. Breckenbridge, New York. It was intimated that the cities would insist upon a physical valuation of the various properties concerned.

Ohio Electric Milk Schedules Suspended.—On Sept. 5 the Public Utilities Commission suspended the new milk transportation schedules of the Ohio Electric Railway, Springfield, for thirty days. They were to have become effective on Sept. 10. As stated on page 417 of this paper for Sept. 8, the new schedules provided that all milk and cream would be carried on freight instead of on passenger cars. The Greater Dayton Association, the Springfield Traffic Association and other organizations, as well as milk producers and distributers, protested against the change.

San Francisco Rate Hearing Postponed.—Testimony regarding valuations of the Southern Pacific Company and the San Francisco-Oakland Terminal Railways was taken at a hearing before the California Railroad Commission on Sept. 5. As announced in the Electric Railway Journal of Aug. 25, page 333, the companies made application to the commission for an increase in fares for its service between San Francisco and points in Alameda County. Further hearing on the application was put over until Nov. 12, when the Key Route's petition of a similar nature will be reopened. The application of the Key Route was noted on page 1116 of this paper for June 16.

Railway Seeks to Operate Buses.—An application has been filed with the Railroad Commission of California by the Peninsular Railway to operate auto buses from the Southern Pacific Depot near Palo Alto, Santa Clara County, to the most southerly barracks in the cantonment at Camp Fremont, San Mateo County. The Peninsular Railway operates an electric system 100 miles long in Santa Clara County and says that its purpose is to run buses to make direct connection with its interurban cars, Palo Alto city cars, and cars to Stanford University. The company proposes to operate Fadgl auto buses, each seating eighteen persons, and to charge a 5-cent fare.

New Traffic Ordinance in Dallas.—A new traffic ordinance became effective in Dallas, Tex., on Sept. 6, which gives the police department authority to regulate all vehicles on the city streets and touches in several particulars the operation of electric railway cars. According to its provisions cars shall stop on the near side so as not to obstruct traffic on intersecting streets; no vehicle shall stand at any street intersection nearer than 10 ft. to the property line of the intersecting street longer than is necessary to let passengers on or off, but on the near side of the street where cars stop no vehicle shall stand within 60 ft. of the property line; persons riding bicycles are prohibited from hanging onto any conveyance; and electric railway cars shall have right of way over all other vehicles except police patrols, fire equipment and ambulances. The front exit from electric railway cars will also be encouraged. At the request of the officials this was not written into the ordinance but was left for voluntary enforcement by the companies.

Personal Mention

Dr. H. R. McGraw has been appointed company physician for the Denver (Col.) Tramway to fill the vacancy made by the death of Dr. L. T. Durbin.

Edgar Watkins, attorney-examiner for the Interstate Commerce Commission, has resigned. Mr. Watkins will return to the practice of law.

R. W. Levering has been appointed to succeed Jack Abbott as superintendent of the Lafayette division of the Fort Wayne & Northern Indiana Traction Company.

J. N. Cadby, who for nearly ten years has been connected with the Railroad Commission of Wisconsin, has resigned from the commission and opened a consulting engineering office in Madison, Wis.

J. H. Botz, statistician and accountant for the Public Utilities Commission for the District of Columbia, has tendered his resignation. Mr. Botz will become associated with Andrew Sangster of Chicago in utility valuation work.

E. S. Myers, electrical engineer for the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been appointed general manager of the Vicksburg Light & Traction Company, Vicksburg, Miss., to succeed O. H. Simonds.

E. E. Potts, general storekeeper of the Kentucky Traction & Terminal Company, Lexington, Ky., has been appointed purchasing agent of the Kentucky Traction & Terminal Company, the Lexington Utilities Company and the Lexington Ice Company.

W. P. Strandborg, publicity agent of the Portland Railway, Light & Power Company, Portland, Ore., has been elected secretary-treasurer of the Pacific Coast Advertising Men's Association. The next annual convention of the association will be held in Portland.

Edgar G. Deis, for the last ten years in the mechanical department of the Brooklyn (N. Y.) Rapid Transit Company as engineer of materials under W. G. Gove, superintendent of equipment of the company, has been appointed manager of the service department of the Railway Improvement Company, New York, N. Y.

O. H. Simonds, general manager and purchasing agent of the Vicksburg Light & Traction Company, Vicksburg, Miss., has been appointed general manager of the Dubuque (Iowa) Electric Company to succeed E. M. Walker, resigned. Both the Vicksburg and the Dubuque properties are controlled by Elston & Company of Chicago.

R. W. Spofford, general manager of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., has been appointed to a position in the United States naval service and hereafter will devote only two days of each week to railway management. His duties will otherwise be in charge of Lewis Keim, purchasing agent of the company.

T. F. Grover received a beautiful silver loving cup from employees of the Terre Haute division of the Terre Haute, Indianapolis & Eastern Traction Company upon his departure to South Bend, Ind. Mr. Grover is now vice-president and general manager of the Chicago, South Bend & Northern Indiana Railway, as noted recently in this paper.

Bruce Cameron, superintendent of transportation of the United Railways, St. Louis, Mo., who it has been reported received an offer of a managerial position with The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will remain with the United Railways, according to an announcement made by Richard McCulloch, president of the company. More than 5000 employes signed a petition asking that Mr. Cameron remain in St. Louis.

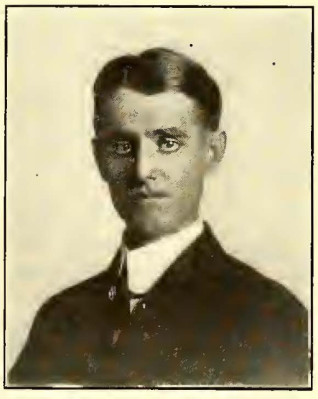
Jack Abbott, superintendent of the Lafayette division of the Fort Wayne & Northern Indiana Traction Company, has resigned effective Sept. 15. He will take up farming, having recently acquired a big ranch in the Mississippi black bottom belt. Mr. Abbott is a graduate of the University of Alabama and of Cornell University. He was for a time con-

nected with the Rome Railway & Light Company, Rome, Ga., and later became superintendent of the Jackson Railway & Light Company, Jackson, Miss. He has been superintendent of the Lafayette property since June, 1912, and has proved himself to be a very able executive.

John H. Lucas has retired from the presidency of the Kansas City Light & Power Company, Kansas City, Mo., and will be succeeded by J. F. Porter of Davenport, Iowa, as noted in this paper last week. Mr. Lucas has been connected with the electric railway and light companies in Kansas City for many years. He established the law firm of Johnson & Lucas in that city in 1879 and soon afterward became general counsel for the cable railway and continued with other companies as consolidations were effected, becoming counsel for the Metropolitan Street Railway in 1902. He was also legal adviser for the Kansas City Electric Light Company after its organization in 1884. He continued as legal adviser for both companies and subsequently served in the same capacity with the Kansas City Railway & Light Company, the successor company, but following the receivership of the Metropolitan Street Railway and the segregation of the railway and lighting properties in Kansas City he continued his service only with the light company with which he served as president.

William M. Casey, heretofore general superintendent of transportation of the Denver (Col.) Tramway, recently became associated with John A. Beeler, consulting engineer, New York City. He had been connected with the Denver Tramway since 1902. He was first division superintendent and in 1909 was promoted to the position of trainmaster in charge of traffic and discipline. Later he was made general superintendent of transportation. Mr. Casey is at present assisting in the service investigation on the Boston (Mass.) Elevated Railway. He was born in Ireland in 1870 and received his early education in Lawrence, Mass. In 1888 he went West and with a love for adventure enlisted in the United States Army, whose chief occupation then was subduing insurrections of hostile Indian tribes. Four years later he was employed by the Denver City Cable Company in the transportation department, and the following year was made carhouse foreman. His next connection was with the Denver Tramway. Mr. Casey's keen insight into human nature and his early experiences have been of great value in training others and in maintaining discipline.

T. E. Leland, heretofore assistant general freight agent for the Bay State Street Railway, Boston, Mass., as reported last week, has been appointed general freight agent of the company. Mr. Leland's railroad work has been largely in the steam railroad field. He began as operator and agent for the Ohio Southern Railroad at Jeffersonville, Ohio, when sixteen years of age. After several promotions he became agent at Washington Court House in March, 1901, in charge of both freight and passenger business. His next connection was in the passenger department of the Denver & Rio Grande Railroad until 1906 when he became chief clerk to the local freight agent and superintendent of terminals of the Missouri Pacific Railroad at Pueblo. Following a short connection with the St. Louis Southwestern Railway the following year he re-entered the service of the Missouri Pacific with headquarters at Kansas City, becoming assistant local freight agent. Mr. Leland's electric railway experience began in 1909 when he was employed in the accounting department of the Metropolitan Street Railway, now the Kansas City (Mo.) Railways. He continued in that capacity until June, 1913, when he entered the service of the Bay State Street Railway as local express agent at Boston. Later he was made assistant general freight agent, his last position. Mr. Leland has a keen appreciation of the possibilities for development in the electric freight field.



T. E. LELAND

E. M. Walker has resigned as general manager of the Dubuque (Iowa) Electric Company, the position he has held for the last five years. During the first four years of this period the company was known as the Union Electric Company. Upon its purchase by interests represented by Elston & Company, Chicago, in 1916, it was reincorporated. Under Mr. Walker's management the gross earnings of the company, including both the light and railway properties, increased approximately 50 per cent; the number of lighting and power customers was nearly trebled, and most cordial relations have been maintained between the company, employees and the public. Mr. Walker has been one of the leading spirits in the commercial and social life of Dubuque, one of his recent achievements in this respect being the winning of a bronze and silver cup for selling more Liberty bonds than any other individual in the city. His sales totaled $85,000 and included 291 different subscriptions. He is chairman of the Red Cross work in Dubuque and has been active in the Dubuque Commercial Club and in other ways in civic affairs. Mr. Walker is well known for his activity in association work, having served as president of the Iowa section, N.E.L.A., and now is a member of the board of directors. In 1910 he was vice-president of the Iowa Street & Interurban Railway Association and he has served for two years as a member of the passenger traffic committee of the American Electric Railway Transportation & Traffic Association. From this it can be seen that Mr. Walker has been a popular leader among the railway and lighting operators of the State. He began his public utility work immediately after his graduation in 1897 from Williams College with an A.B. degree. After serving one year with the Lockport Gas & Electric Company he became connected with the Hyde Park (Mass.) Gas Company as secretary and assistant superintendent. Three years later he became general manager of the company. In 1893 he was appointed general manager of the Bristol Gas & Electric Company, Bristol, Tenn., and four years later he became general manager of the Citizens' Railway & Light Company, Muscatine, Iowa. This connection was followed by his appointment as general manager of the Union Electric Company and of its successor, the position he has just relinquished.

E. M. WALKER

Obituary

George W. Travis, former claim agent for the Alton, Granite & St. Louis Traction Company, died at the St. Joseph's Hospital, St. Louis, on Sept. 10 at the age of fifty years.

Dugald G. Porter, manager in Rock Island and Moline of the Tri-City Railway & Light Company, Davenport, Iowa, died suddenly on Sept. 1. Mr. Porter was a son of Joseph F. Porter, formerly president of the Tri-City Railway & Light Company.

Lloyd D. Mathes, who has been general superintendent of the electric division of the Norfolk Southern Railroad since 1911, died of typhoid-pneumonia at his home in Norfolk, Va., on Sept. 5. Mr. Mathes was general manager of the Union Electric Company, Dubuque, Ia., now known as the Dubuque Electric Company, from 1903 to 1911. During this connection he was very active in the work of the Iowa Street & Interurban Railway Association, of which he served a term as president. Prior to that time he was general superintendent of the Trenton & New Brunswick Railroad. Mr. Mathes was a native of Memphis, Tenn., and gained his first experience with the Memphis & Charleston Railroad of that city. He was employed by the General Electric Company and the Westinghouse Electric & Manufacturing Company and later held important positions with electric railways in various parts of the country.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Galesburg, Rockford & Northern Railroad, Galesburg, Ill.—Incorporated to construct an electric railway from Galesburg to Rockford, through Bureau, Henderson, Knox, Lee, Ogle, Whiteside and Winnebago Counties. Capital stock, $200,000. R. J. Emery, 19 South La Salle Street, Chicago, is interested. [Aug. 18, '17.]

Wichita-Walnut Valley Interurban Railway, Wichita, Kan.—Incorporated to construct an electric railway from Wichita to El Dorado, thence to Augusta, Douglas, Rock and Winfield, where it will connect with the Southwestern Interurban Railway. The line will penetrate the big oil fields of Butler and Cowley Counties. Capital stock, $2,000,000. Charles Payne, secretary. [July 7, '17.]

***Okmulgee (Okla.) Traction Company.**—Incorporated to construct and operate an electric railway system in Okmulgee. Capital stock, $100,000, being 1000 shares of par value of $100 each. Incorporators, Elmer E. Feistel and A. K. Feistel, Tulsa, Okla.; M. M. Simons, Okmulgee, Okla., and R. Thurlow Bartlett and E. M. Buston, Portland, Me.

FRANCHISES

Kansas City, Mo.—The City & Leeds Railway has received a franchise from the County Court for the construction of an electric railway that is planned to connect Kansas City with some of the smaller towns of the county. The first parts of the road are to be built with money from the proceeds of land operations by syndicates now being formed. The Clinton Construction Company, Willard E. Winner, president, is arranging the syndicates and will build the road. Grading is now being done on 1 mile of line to be put into operation first within the limits of Kansas City to connect Leeds with the present terminus of the lines of the Kansas City Railways at Thirty-first Street and Raytown Road. C. H. Witthar, Independence, Mo., president. [Sept. 1, '17.]

Passaic, N. J.—The Public Service Railway will ask the City Council of Passaic for a franchise to double-track River Drive.

Cincinnati, Ohio.—The street railway committee of the City Council of Cincinnati has recommended the acceptance of the bid of the Cincinnati, Newport & Covington Street Railway for the Green Line route franchise for a period of twenty-five years . The fare is to be 5 cents with universal transfers in Cincinnati.

***Coatesville, Pa.**—Paul S. Stansbury, Coatesville, has purchased a trolley franchise recently granted to local capitalists by the City Council, which is to extend over the city streets to the iron and steel mills, a distance of about 2 miles, and then to proceed north to Honeybrook and other towns.

Greensburg, Pa.—The West Penn Railways has asked the City Council of Greensburg for a franchise for the construction of an extension of its West Otterman Street line from its present terminal to the borough line and the building of a switch at East Otterman and Main Streets.

TRACK AND ROADWAY

Calgary (Alta.) Municipal Railway.—About ½-mile of temporary track is being built by the Calgary Municipal Railway to the site of the new reservoir to haul gravel and other construction supplies.

Pacific Electric Railway, Los Angeles, Cal.—The Board of Public Works has let a contract for the erection of a reinforced concrete bridge over the tracks of the Pacific Electric Railway at West Boulevard and Sherman Way to W. M. Ledbetter, Los Angeles, at $24,957.

Pacific Gas & Electric Company, Sacramento, Cal.—A bond for $15,000 will be filed by the Pacific Gas & Electric Company for permission to operate in Vallejo.

Municipal Railways of San Francisco, San Francisco, Cal.—The contract for the construction of outer tracks for the Municipal Railways from Van Ness Avenue to Castro Street, on Market Street, was let by the Board of Works to James M. Smith for $36,960. The Board of Works asked the Board of Supervisors to appropriate this sum, besides $1,500 for a possible bonus; $2,500 for inspection; $61,525 for the purchase of track special work; $20,000 for trolley wires and poles on Upper Market Street; $150,000 for Lower Market Street construction; $90,000 for the line from the west portal of Twin Peaks tunnel to Twentieth and Taraval Streets; $46,500 to complete the tunnel, and $5,000 for freight and handling of materials, a total of $413,985.

Georgia Railway & Power Company, Atlanta, Ga.—Work will soon be begun by the Georgia Railway & Power Company reconstructing the Edgewood Avenue line between Piedmont Avenue and Jackson Street.

Des Moines (Iowa) City Railway.—President Emil G. Schmidt of the Des Moines City Railway states that unless the market for loans improves he will postpone all major improvements until after the close of the war. The program of improvements contemplated by the company included one entirely new line.

***Jenkins, Ky.**—The Consolidation Coal Company, Jenkins, is interested in the construction of an electric railway in Jenkins, to connect with Burdine, Dunham, East Jenkins. McRoberts, Fleming and Haymond.

Owensboro (Ky.) City Railroad.—Work will be begun at once by the Owensboro City Railroad on the construction of several miles of additional lines connecting with important suburbs.

Hagerstown & Frederick Railway, Frederick, Md.—Work will be begun immediately by the Hagerstown & Frederick Railway reconstructing its North Potomac Street line from Franklin Street to the Gray Gables, Hagerstown.

Brooklyn (N. Y.) Rapid Transit Company.—The Eastern Contracting Company, Brooklyn, has the contract for constructing this company's extension of the Metropolitan Avenue surface line from its present terminus at St. John's Cemetery, Middle Village, to Jamaica. It is expected that the line will be completed at the end of this month.

New York Municipal Railway, Brooklyn, N. Y.—The main portion of the new Broadway subway, Manhattan, was placed in operation under the direction of the Public Service Commission for the First District of New York, by the New York Municipal Railway on Sept. 4. The operation of the new line, as at present constituted, is in connection with the Fourth Avenue subway in Brooklyn and the Sea Beach branch for through service, with a short line service provided between Union Square and the station at Ninth Avenue and Thirty-eighth Street in Brooklyn on the Culver and West End lines.

***Cedar Point, Ohio.**—George A. Boeckling, president of the Cedar Point Company, plans to construct a railway to connect the Cleveland & Buffalo line docks and the Cedar Point resort grounds, about 1 mile.

Cincinnati, Ohio.—The street railway committee of the City Council of Cincinnati on Sept. 7 requested Street Railway Commissioner W. C. Culkins to investigate the advisability of track extensions on nine different routes and make recommendations according to his finding. The proposed extensions are as follows: McMicken-Main across the Hopple Street viaduct to Beekman Street; North Fairfield, from Beekman Street and Baltimore Avenue to Colerain Avenue; Auburn Avenue, from Erkenbrecker and Vine Streets, on Erkenbrecker and Dury Avenues, to Carthage; Madisonville, on Madison Road to Bramble Avenue; Crosstown to Coney Island and Mt. Washington on Beechmont Avenue; Sedamsville, from Anderson's Ferry to southwestern corporate line; John Street, on Quebec Road to Glenway and Seton Avenues; Warsaw, on Bridgetown Road to Harvest Home grounds, and double-tracking Central Avenue.

Columbus, Delaware & Marion Electric Company, Columbus, Ohio.—A contract has been awarded to B. F. Patterson for the relocation of 1½ miles of track of the Co-

lumbus, Delaware & Marion Electric Company. The track on North High Street from Clintonville, suburb of Columbus, to Stop 15 are to be moved from the side to the center of the highway, as required by the County Commissioners. Span construction will be used for the overhead system. The contract aggregates $35,000, but the company will do considerable work in connection with the change and the actual cost will be much more. Eli M. West, president of the company, placed the order for rails for this section of track more than a year ago.

Oklahoma Union Railway, Tulsa, Okla.—Official announcement has been made that this company's extension from Tulsa to Sapulpa, 15 miles, will be completed and placed in operation on Nov. 1.

London & Lake Erie Railway & Transportation Company, London, Ont.—It is reported that negotiations have been resumed with the St. Thomas City Council by representatives of the London & Lake Erie Railway & Transportation Company with a view to the sale of that portion of the line from St. Thomas to Port Stanley.

London (Ont.) Street Railway.—Plans have been approved by the Ontario Railway and Municipal Board for proposed additions to the London Street Railway.

Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont.—This company will extend its tracks over the new Burgoyne bridge, across the old Welland Canal.

Philadelphia, Pa.—The Keystone State Construction Company has signed two of the delivery loop contracts for the city's high speed lines. Ground will be broken within three weeks. The contracts signed are for the Locust Street section, to cost $1,713,715, and the Arch Street section, to cost $1,575,760. The other contracts which have been awarded to the Keystone State Construction Company for the Broad Street sections are held up for the present in hopes of better conditions as regards delivery of material. It is expected that they will be signed later.

Columbia Railway, Gas & Electric Company, Columbia, S. C.—A contract has been awarded by the Columbia Railway, Gas & Electric Company for the grading on a 1¼-mile extension of the double-track line at Camp Jackson. The line will be extended from the present terminus at the camp, parallel with the camp for this distance. The line will be further extended when the government demands require it.

San Antonio (Tex.) Public Service Company.—The construction of an extension to Camp Travis is being contemplated by the San Antonio Public Service Company.

Tacoma (Wash.) Municipal Railway.—The first step in the extension of Tacoma's municipal carline to serve the newly developed tideflats area has been begun by the construction of the viaduct over the car shops of the Chicago, Milwaukee & St. Paul Railroad on the tideflats. Construction of the viaduct, which is being done jointly for the city and the railroad on force account by the Tacoma Dredging Company, will be the biggest job on the extension work. The city will build the viaduct approaches, and the railroad the viaduct proper. The western approach will be 600 ft. long. There will be two 500 ft. approaches, both with a 5 per cent grade on the east side. The viaduct will be 44 ft. wide over all, and will have room for the car track and a 24-ft. roadway. There will be a 400 ft. siding on the west approach for cars to pass. The other sidings will be on the ground level. The section of the viaduct to be built for the Chicago, Milwaukee & St. Paul Railroad will include nine spans, three of which will be 60 ft. long, and six 40 ft. long.

SHOPS AND BUILDINGS

Northern Electric Railway, Chico, Cal.—Fire recently destroyed the passenger and freight station of the Northern Electric Company at Target.

Detroit (Mich.) United Railway. — The new east side freight station of the Detroit United Railway at Monroe Avenue and Macomb Street, between St. Aubin Avenue and Dubois Street, has been completed and is now in use. The company has under construction a west side terminal on Fort Street, between Fifteenth and Seventeenth Streets, a portion of which will be ready for occupancy in a short time.

New York Municipal Railway Corporation, Brooklyn, N. Y.—Bids will be received by the New York Municipal Railway Corporation until Oct. 1 for the construction of trainmen's building, signal towers, circuit breaker houses and additional platforms and control facilities in connection with the Coney Island terminal. Plans and further information may be obtained at the chief engineer's office, 85 Clinton Street, Brooklyn.

Valley Railways, Lemoyne, Pa.—Property is being acquired by the Valley Railways at the west end of the Walnut Street bridge, Wormleysburg, and it is reported that the company will construct a carhouse and power station on the site.

Monongahela Valley Traction Company, Fairmont, W. Va.—This company will erect an addition to its recently completed terminal at Clarksburg for dispatcher's office.

POWER HOUSES AND SUBSTATIONS

Alabama Power Company, Anniston, Ala.—The power plant of Alabama Power Company at Albany is being enlarged and additional machinery installed. The old engine will be replaced by a new Corliss engine and two of the five boilers will be overhauled and rebuilt. The total cost of the improvements is estimated at $10,000.

Montgomery Light & Traction Company, Montgomery, Ala.—This company contemplates the construction of a substation equipped with five rotary converters with accessories.

Georgia Railway & Power Company, Atlanta, Ga.—A contract has been awarded by the Georgia Railway & Power Company to W. H. George, Atlanta, to construct a substation near the Ashby carhouse of the company to furnish light and power for that section of the city. A new substation is being built just beyond Buckhead to serve the new extension to Camp Gordon with power. The company is changing the anchor towers and insulators on the Tallulah transmission line to the suspension type at a cost of about $125,000.

Hagerstown & Frederick Railway, Frederick, Md.—A high-tension line, to carry a 33,000-volt current, will be built from Security to Waynesboro to supply the Chambersburg, Greencastle & Waynesboro Street Railway with current. The Waynesboro Electric Light & Power Company will construct the line from Waynesboro to the State line, a short distance north of Ringgold, and the Hagerstown & Frederick Railway will build the line from its plant to the Mason and Dixon line and join with the Waynesboro line there. The Waynesboro power plant may be abandoned in the course of a month or so after the new current reaches there.

Kansas City Light & Power Company, Kansas City, Mo.—This company has contracted with the General Electric Company for two 25,000-kw. generator units as the first unit for installation in a new power house designed for an ultimate capacity of 240,000 kw. Delivery on the first of these two machines is expected in January, 1919, and the other in August of the same year. Heretofore the Kansas City Light & Power Company has purchased its power from the Kansas City Railways. The latter's plants are badly overloaded and the lighting company is, therefore, proceeding to construct a power plant of its own which will gradually take over the load from the railway company's stations.

Kansas City (Mo.) Railways.—The Wyandotte County Commissioners have refused to grant the Kansas City Railways the privilege to erect cables on the new Central Avenue viaduct to connect the Kaw River power house with the power plant at Second Street and Grand Avenue.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will construct a four-story reinforced concrete plant, adjoining its present plant at Georgetown, at a cost of $200,000.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—The Locomotive Pulverized Fuel Company, 30 Church Street, New York, N. Y., has received a contract from the Milwaukee Electric Railway & Light Company to equip the 2500-hp. boilers at its Oneida Street plant with apparatus for the burning of pulverized coal.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Deliveries on Supplies Improving

Manufacturers Furnishing Small Repair Parts Promptly—Railways with Annual Contracts Fortunate

Deliveries on many railway supplies are gradually improving, according to the president of an electric railway of medium size in an Eastern state. The speaker was in a good position to know because in addition to his executive duties he gives a great deal of attention to the purchases made by his company. Continuing, he said:

"There are a number of products such as trucks, steel wheels, girder rail, insulators, etc., on which the delivery situation remains unchanged but deliveries on the majority of railway supplies are better than for some time past. A number of manufacturers have advised that raw materials which have been on order for a considerable length of time are being received in larger quantities than heretofore, thus enabling the manufacturers to increase production and to fill many orders of long standing on the books of the various companies. The recent improvement in the car shortage situation is quoted by one manufacturer of steel rail products as being responsible for the good deliveries now being made by that particular company.

"Manufacturers of motors are making good deliveries on repair parts and other small miscellaneous repairs. There has been a great demand for these parts, and the manufacturers are keeping their bins well stocked. Rail bonds have for the most part been delivered out of stock and no difficulty has been encountered except where very large orders have been placed. Some railways which have been using a 36½-in. bond for the last few years are seriously considering the use of a 4-in. or 6-in. bond or of a welded joint. This has been forced upon them by the steadily increasing price of bonds. The 36½-in. bond which several years ago sold for about $45 per hundred is now quoted at about $130. Deliveries on special work have improved greatly in a number of instances. Frogs, switches and mates, etc., have been obtained in from sixty to ninety days where formerly from four to six months were required."

Labor Situation Difficult

Testimony from this speaker and other electric railway officials indicate that the high prices being paid for labor in and around the cantonments and munitions factories have caused a great deal of disorganization in the railways' forces. Certain street improvements and the laying of rail for extensions have been delayed in a number of instances on account of not having sufficient labor. The track department is not the only one which is facing a shortage of men. All departments are suffering alike, the worst shortage, however, being felt among the shop men and the employees of the track department. In former times, immigration helped to solve most of the labor troubles. Since the beginning of the war, however, there has been a noticeable shortage of labor in all industries.

Railways Buying on Contract Basis Fortunate

Some of the railways are particularly fortunate in having contracts on an annual basis for certain repair parts, brake shoes, lubricating oils, etc., and in a number of instances these contracts have several years yet to run. The contracts are being kept by the different companies involved although deliveries on axles, steel wheels or like products have not been made on the exact dates specified on account of inability on the part of the manufacturer to obtain raw materials. In every case, however, so far as is known, the railway has been taken care of with delivery of a part of the order at the time promised.

Increased Cost of Supplies

Figures from the Boston Elevated Railway Show Increases of from 4 to 400 per Cent in Three Years

The following table was filed on Sept. 6 by M. C. Brush, president, Boston Elevated Railway, with the Massachusetts Legislative Commission, in connection with the hearing it is conducting on electric railway fares in Boston.

Boston Elevated Railway Company
Bureau of Purchase
Comparative Costs of Materials, 1914, and August, 1917

	1914		1917		Increase, per Cent
Rails, girder	$38.80	G.T.	$52.80	G.T.	36
Rails, T	33.94	G.T.	44.36	G.T.	30
Rail joints	38.80	G.T.	72.80	G.T.	87
Crossover, track	979.00	each	1,772.00	each	81
Switches, track	149.40	each	394.00	each	164
Mates, track	112.40	each	299.00	each	166
Frogs, track	112.00	each	251.00	each	124
Spikes, track	.0157	lb.	.0514	lb.	227
Tie rods	.0179	lb.	.0485	lb.	171
Tie plates, c.i.	.0103	lb.	.0289	lb.	180
Tie plates, steel	.0145	lb.	.0495	lb.	241
Bolts, track	.0340	lb.	.0690	lb.	187
Bolts, track, O.K.	.08	each	.18	each	125
Bolts, machine	85%-2½% disc.		50%		241
Rivets	$0.0165	lb.	$0.0507	lb.	207
Axles	.0240	lb.	.0678	lb.	182
Wheels, c.i. (exchange basis)	.66	cwt.	1.325	cwt.	100—Market price today $1.75 cwt., incr. 165%
Wheels, steel, 33"	15.50	cwt.	27.25	cwt.	75
Castings, gray iron	.0240	lb.	.0370	lb.	54
Castings, gray iron	.0240	lb.	.05	lb.	108
Castings, malleable	.0345	lb.	.0769	lb.	123
Castings, steel	.0615	lb.	.238	lb.	287
Steel bars (mill shipment)	.0123	lb.	.0319	lb.	159
Steel bars (Boston stock)	.0165	lb.	.0510	lb.	209
Steel plates (Boston stock)	.0160	lb.	.08	lb.	400
Steel, tool, bigh speed	.50	lb.	2.50	lb.	400
Steel, tool, carbon	.055	lb.	.10	lb.	82
Brake shoes	38.61	M. miles	76.26	M. miles	97
Journal boxes	3.50	each	11.25	each	221
Springs, car	.0205	lb.	.0580	lb.	183
Gears	11.00	each	20.52	each	87
Pinions	3.65	each	6.66	each	82
Gear cases	10.00	each	19.85	each	98
Nails, cut	.0180	lb.	.0391	lb.	117
Boiler tubes	.097	ft.	.38	ft.	291
Tubular poles	.0243	lb.	.0469	lb.	93
Trolley tubing, brass	.15	lb.	.40	lb.	166
Trolley wheels	.45	each	.90	each	100
Copper trolley wire	.165	lb.	.39	lb.	136
Copper cable 2,000,000 c.m.	1,322.49	M. ft.	3,228.00	M. ft.	144
Copper bonds	40%-2½%-5% disc.		10%		62
Signal cranks	$0.62	each	$1.10	each	77
Ash, 4"	72.00	M.	115.00	M.	60
Hard pine, prime	30.00	M.	62.00	M.	106
Spruce	23.00	M.	33.50	M.	46
Sand	.50	cu. yd.	.60	cu. yd.	20—Market price today, $1.00 cu. yd. incr. 100%
Stone, crushed	.97	ton	1.55	ton	60
Cement, Portland	1.62	bbl.	1.82	bbl.	12—Mraket price today $2.37 bbl. incr. 46%.
Rope, Manila	.11	lb.	.305	lb.	177
Rope, wire	70% disc.		15%-12½%-5%		135
Tape, cotton, 1 in	80% gross		$1.75	gross	118
Tape, asbestos	$0.34	lb.	1.30	lb.	282
Waste, white	.7½	lb.	.11⅜		52
Waste, wool	.12	lb.	.21¾		81
Tape, linen, ¾"	.35	gross	.95	gross	171
Webbing, cotton, 1"	.85		1.85	gross	117
Hose, linen fire, 2½"	.15¾	ft.	.315	ft.	100
Drills, twist, carbon steel	75%-10%-5% disc.		60%		87
Drills, twist high speed steel	$2.55	each	$9.64		278
White lead	.059	lb.	.12⅜		110
Linseed oil	.55	gal.	1.14	gal.	107
Shellac	.17	lb.	.57	lb.	235
Glue	.10	lb.	.30	lb.	200
Alcohol	.33	gal.	.90	gal.	172
Oil, engine	.1425	gal.	.225	gal.	58
Oil, cylinder	.23⅜	gal.	.24½	gal.	4
Oil, fuel	.0425	gal.	.065	gal.	53—Market price today 8c. gal., incr. 88%.
Gasolene	.14	gal.	.21½	gal.	53—Market price today 25c. gal., incr. 79%.
Motor control and lighting equipment for surface cars	2,450.00 Purchased 1915		No purchase Market price $5,500.00		124
Trailer car bodies and trucks	$2,199.00		No purchase Market price $5,400.00		145

Insulating Materials in Great Demand

Good Deliveries on Staple Lines—Increased Fuel Costs Create Demands—Government Orders Given Preference

Deliveries on fiber conduits, heavy fuses and other insulating products can be made in from three to five weeks. Deliveries on magnesia pipe covering are not quite as good. According to reports received from the Magnesia Association of America the shipbuilding program demands increasing quantities of magnesia pipe covering and blocks for insulating boilers and steam lines. The magnesia interests have arranged to give the government preference and while there may at times be some shortage due to extreme difficulty in securing labor and possibly due to poor deliveries of coal and coke, at the same time the industry is in reasonably good shape and will at least take excellent care of the needs of the government and of those large industries upon which the government is dependent for steel and munitions.

Owing to the tremendous industrial activities, steam plants and factories are being run on two or three shifts instead of on one so that everything subject to wear is deteriorating much more rapidly than heretofore. This accounts for a great many orders for maintenance materials which are being received regularly by the different companies. There is also a particularly large demand for pipe covering which has been brought about directly through increased fuel costs.

Factors Affecting Increased Prices

Formerly much of the asbestos used in this country came from Canada. Asbestos was also shipped into this country from Russia and Norway. Under date of Aug. 9, 1917, however, the Norwegian government has, until further notice, placed an embargo on the exportation of asbestos of all kinds as well as on articles made of asbestos. As this supply has been cut off, American manufacturers are now dependent upon this continent for their raw material, and this has greatly increased the cost of asbestos. Many other factors can be mentioned which have caused the increase in the price of asbestos products, such as shortage of labor, increased fuel costs, car shortage and embargoes, in addition to the increased cost of mining.

Effect of Government Orders for Material

Despite the efforts of the different companies to greatly increase their production on account of war demands, their resources will be taxed to the limit to furnish materials to all customers in case the government should place large orders. With the extraordinary high prices for materials and labor, it is not expected that nearly as much building will be done this year as previously and some of these stocks which usually go into buildings will be available for other purposes.

Industrial Service Department Established by National City Bank

In order to render the greatest possible service to its patrons among the manufacturing industries, the National City Bank of New York has established an industrial service department. This department will gather and disseminate new ideas about industrial methods and industrial conditions with a view to keeping its customers well informed upon all developments of interest, both at home and abroad.

The department is headed by F. C. Schwedtman, a vice-president of the bank, who has had much experience in industrial management. It is not the intention of the National City Bank to compete with the engineering firms who make a specialty of advice upon efficiency management, but rather to stimulate interest in the study of improved methods, and to give such information and counsel as can be rendered without charge.

Reports of 691 mills to the National Lumber Manufacturers' Association show that during the month of June these mills cut 1,499,000,000 ft. of lumber and shipped 1,581,000,000 ft., the largest volume ever reported during one month.

Coal Situation Unsettled

Government Price Does Not Affect Contracts Made Previous to Aug. 21—Big Demand but No Coal Available at $2 per Ton

As noted in the July 28 issue of the JOURNAL, a number of railways in the Middle West have combined forces and have purchased producing coal mines outright in order to insure an adequate coal supply for the coming winter. The majority of the railways, however, have not been so fortunate, and the separate companies must work out their own solution of the coal problem independently. It is true that while many of the railway companies are covered by contracts the continual decrease in production and the possibility of a large car shortage are factors which cannot be overlooked. Last winter a number of contracts were broken by the operators on the pretext of not having enough cars, and the railway men are not anxious to repeat the task of buying coal locally at prohibitive prices.

At the present time there is no bituminous coal available at government prices. Practically all of the operators have accepted contracts at prices considerably above $2 per ton and it is expected that these contracts will absorb the output of most of the mines for three to four months. The office of Dr. Garfield, the coal administrator, has announced that bona fide contracts made before Aug. 21 will not be affected by the prices fixed by the government. This is said to apply to contracts extending over a year.

Coal Production Increases 6 per Cent for Past Week

The weekly coal statement issued by the United States Geological Survey shows that the nation's coal production has increased 6 per cent for the week ending Aug. 25 over the week ending Aug. 18, when a drop of 9½ per cent was noted, chargeable almost entirely to labor troubles. The ratio of tonnage produced to full time capacity was 68.5 per cent as compared with 62.5 per cent for the previous week. The recovery was largely due to the partial cessation of strikes in the Illinois field which raised the ratio for that State from 54.8 to 69.8 per cent.

NEW YORK METAL MARKET PRICES

	Sept. 6	Sept. 13
Prime Lake, cents per lb.	25¼	25½
Electrolytic, cents per lb.	25¼	25½
Copper wire base, cents per lb.	36	36
Lead, cents per lb.	10¼	9¾
Nickel, cents per lb.	50	50
Spelter, cents per lb.	8¼	8¼
Tin, Straits, cents per lb.	61	61⅜
Aluminum, 98 to 99 per cent, cents per lb.	47	43½

OLD METAL PRICES

	Sept. 6	Sept. 13
Heavy copper, cents per lb.	24	24
Light copper, cents per lb.	21	20½
Red brass, cents per lb.	19	18½
Yellow brass, cents per lb.	15½	15¾
Lead, heavy, cents per lb.	8½	8½
Zinc, cents per lb.	6	6
Steel car wheels, Chicago, per net ton	$42.00	$42.00
Old car wheels, Chicago, per gross ton	$32.50	$33.50
Steel rails (scrap), Chicago, per gross ton	$41.00	$41.00
Steel rails (relaying), Chicago, per gross ton	$55.00	$55.00
Machine shop turnings, Chicago, per net ton	$17.50	$18.00

RAILWAY MATERIALS

	Sept. 6	Sept. 13
Rubber-covered wire base, New York, cents per lb.	36	36
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable (stranded), New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33½	33½
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, Bessemer, Pittsburgh	$38.00	$38.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$40.00	$40.00
Wire nails, Pittsburgh, per 100 lb.	$4.00	$4.00
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$7.00	$7.00
Steel bars, Pittsburgh, per 100 lb.	$4.00	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$8.85	$8.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$10.05	$10.05
Galvanized barbed wire, Pittsburgh, cents per lb.	4.85	4.85
Galvanized wire, ordinary, Pittsburgh, cents per lb.	4.65	4.65
Cement (carload lots), New York, per bbl.	$2.22	$2.22
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.25	$1.23
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.26	$1.24
White lead (110 lb. keg), New York, cents per lb.	12¾	12¾
Turpentine (bbl. lots), New York, cents per gal.	42½	44

ROLLING STOCK

Charleston Consolidated Railway & Lighting Company, Charleston, S. C., is reported to have ordered six double-truck cars.

Rockford & Interurban Railway, Rockford, Ill., noted in the Electric Railway Journal of Sept. 1 as being in the market for cars, has purchased five new 46-ft. end-entrance trailer cars from the St. Louis Car Company.

Michigan Railway, Kalamazoo, Mich., has ordered three new 46-ft. end-entrance trailer cars from the St. Louis Car Company for use in Battle Creek, Mich., in connection with the service to the army cantonment.

Montgomery Light & Railroad Company, Montgomery, Ala., has purchased six closed and three open cars from the Mobile Light & Railroad Company. These cars were needed for service to the cantonment located at Montgomery.

Springfield (Mass.) Street Railway and **Worcester (Mass.) Consolidated Street Railway,** noted in the Electric Railway Journal of May 5 as being in the market for cars, has ordered thirty cars from the Osgood Bradley Car Company, twenty for Springfield and ten for Worcester.

Colorado Springs & Interurban Railway, Colorado Springs, Col., noted in the Aug. 25 issue as having purchased ten one-man cars, has specified the following details for this equipment:

Number of cars ordered.....11	Fare boxes.....Johnson
Date of delivery.. [illegible] 1917	Fenders.....H-B Life guards
Builder .....American Car	Headlights .....Golden Glow
Type .....One-Man Safety	Lightning arresters.....
Seating capacity.....28	G. E. electrolytic
Weight (total).....12,800 lb.	Motors.....Two G. E.-258
Air brakes.....Westinghouse	Seats.....American Car
Designation signs.....Hunter	Trucks.....American Car
Door mechanism.....	Wheels.....24 in. cast iron
Safety Car Devices Co.	

TRADE NOTES

National Lumber Manufacturers' Association, Chicago, Ill., announces the appointment of John Lind as assistant secretary.

Railway Improvement Company, New York, N. Y., has received an order for 1100 Rico coasting recorders from the Twin City Rapid Transit Company.

Eugene J. Barney, formerly associated with the Barney & Smith Car Company, Dayton, Ohio, died at his home in that city on Sept. 4 at the age of seventy years.

Railway Utility Company, Chicago, Ill., has been awarded a contract by the United Railways & Electric Company, Baltimore, Md., for 1364 Utility thermostatic control equipments for regulating the heat in electric railway cars.

J. F. Anglin, formerly manager of the service department of the Railway Improvement Company, is at the reserve officers' training camp at Plattsburg, N. Y. He has been succeeded by E. G. Deis, formerly with the Brooklyn Rapid Transit System.

Arthur C. Sullivan, formerly sales manager of the Hensley Trolley Manufacturing Company, Detroit, Mich., has been appointed a sales representative of the National Railway Appliance Company, New York, N. Y., and will be connected with the Chicago office.

Samuel Swett, manufacturers' agent, importer and exporter, 149 Broadway, New York City, has recently been appointed the exclusive agent in the United States for George Cradock & Company, Ltd., of Wakefield, England, manufacturers of wire and wire rope.

Henry C. Campbell, who has been secretary to A. D. Joyce, general manager of sales and distribution of the Sherwin-Williams Company, has been appointed secretary to President Walter H. Cottingham. Edward Fiala, formerly an assistant in the paint and varnish sales department, has been named secretary to Mr. Joyce. Paul Hart, recently assistant advertising manager of the Wichita (Kan.) *Beacon,* has returned to the Sherwin-Williams employ in the advertising department.

Economy Electric Devices Company, Chicago, Ill., whose organization was mentioned last week, has elected the following officers: L. E. Gould, president and treasurer; Edward Wray, vice-president and F. J. Phelps, secretary. This company has established its headquarters at Room 1690, Old Colony Building, Chicago, and has become the sole distributor of the Sangamo Economy railway meter, a device for checking the energy and man performance of electric railway motor cars and locomotives. The new company has taken over the Economy meter engineering and service departments of the Sangamo Electric Company, manufacturer of the meter. Charles H. Koehler is chief engineer.

Sangamo Electric Company, Springfield, Ill., announces the opening of a Chicago District office in the Old Colony Building, in charge of C. H. Hurtt as district manager. In establishing this new office, the Sangamo Electric Company has made no change in the selling arrangements which it has had for many years with the Electric Appliance Company and the Federal Sign System (Electric) of Chicago, who will continue to handle Sangamo products exactly as in the past. Mr. Hurtt's office adjoins that of the Economy Electric Devices Company, which has recently become the exclusive sales agent of the Sangamo Economy railway meter.

St. Louis Car Company, St. Louis, Mo., has just shipped three new light-weight, safety cars to Albuquerque, N. M., and two to Aberdeen, S. D., both repeat orders of this type of car. The Aberdeen cars weigh 13,500 lb., seat thirty passengers and are arranged for double-end operation. Seven cars of this type were ordered in 1915 and three additional in 1916, and now three more this year. At Aberdeen two of these cars have been in use for over a year and have proven entirely satisfactory in spite of the extreme cold and heavy snow conditions which frequently prevail. That no serious trouble has been encountered because of the light-weight car under these conditions is evidenced by the duplicate order.

NEW ADVERTISING LITERATURE

Worthington Pump & Machinery Corporation, New York, N. Y.: Bulletin W-60-A, descriptive of its Worthington volute centrifugal pumps.

Moore Steam Turbine Company, Wellsville, N. Y.: Bulletin No. 3 describing and illustrating single-stage and multi-stage steam turbines and reduction gears

Hubbard & Company, Pittsburgh, Pa.: Supplementary bulletin No. 1, describing, illustrating and listing the prices of Pierce Presteel racks, brackets, side clamp pins and fuse block clamps.

Dayton Manufacturing Company, Dayton, Ohio: Bulletin 174, describing and illustrating vestibule door half-mortise latch. Bulletin 188 on "Pittsburgh" ratchet drop brake handle. Bulletin 207 on "Dayton" sash fixtures.

Russian Information Bureau, New York, N Y., with the co-operation of the American-Russian Chamber of Commerce, has issued its first bulletin, No. 1A, on the "Russian Market, Its Possibilities and Problems," by A. J. Sack, director of the bureau. This bureau, which has offices in the Woolworth Building, is established and supported by the Russian provisional government. Its purposes are to supply the American public with reliable information regarding economic, financial, political and cultural conditions in Russia.

NEW PUBLICATION

Transactions of the American Institute of Electrical Engineers, Vol. 35.—Published by the Institute, New York City. In two parts, 1924 pages. In paper, $10; in cloth, $11.50.

Of special interest to electric railway men are the following papers appearing in this volume of the A. I. E. E. Transactions: "Operation on the Norfolk & Western Railway," by F. E. Wynne; "The Liquid Rheostat in Locomotive Service," by A. J. Hall; "Chattering Wheel Slip in Electric Motive Power," by G. M. Eaton; "High Voltage D.C. Railway Practice," by Clarence Renshaw. Several papers on the supply of single-phase power from central stations, and on power transmission subjects bear indirectly on the traction field. The volume also contains in full the revised standardization rules and the preliminary report of the American Committee on Electrolysis.